ORDER NO.CHM0503005CE

B12

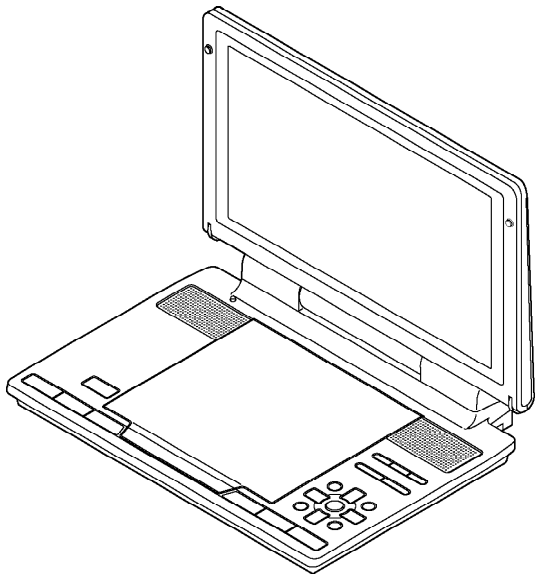
Portable DVD/CD PLAYER

DVD-LS90PP / DVD-LS93P

RAE1905Z-2C Mechanism Series

Colour

(S).....Silver Type



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SPECIFICATIONS

Specifications

Operating temperature range:	**+5 to +35°C (+41 to +95°F)**
Operating humidity range:	**5-85% RH (no condensation)**
Region number:	**Region No.1**
Discs played / [8cm (3") or 12cm (5")]:	**DVD (DVD-Video)** **DVD-RAM (DVD-VR, JPEG(*1, 5))** **DVD-R (DVD-Video)** **DVD-RW (DVD-Video, DVD-VR)** **+R/RW (Video)** **CD, CD-R/RW [CD-DA, Video-CD, SVCD(*1), MP3(*2, 5), WMA(*3, 5), JPEG (*4, 5), HighMAT Level 2 (Audio and Image)]** ***1: Conforming to IEC62107** ***2: Compatible compression rate: between 32 kbps and 320 kbps** ***3: Compatible compression rate: between 48 kbps and 320 kbps** ***4: Exif Ver 2.1 JPEG Baseline files Picture resolution: between 320×240 and 6144×4096 pixels (sub sampling is 4:2:2 or 4:2:0)** ***5: The total combined maximum number of recognizalbe audio and picture contents and groups: 4000 audio and picture contents and 400 groups.**
Signal system:	**NTSC**
LCD screen:	**9" α-Si, TFT wide-screen LCD**
Composite-video output:	
Output level:	**1Vp-p (75 Ω)**
Output terminal:	**Mini-jack**
Number of terminals:	**1system**
Audio output:	
Output level:	**1.5Vrms (1kHz, 0dB, 10k Ω)**
Output terminal:	**Stereo mini-jack**
Number of terminals:	**1system**
Audio performance:	
(1) Frequency response:	
● DVD (linear audio):	**4Hz-22kHz (48kHz sampling)** **4Hz-44kHz (96kHz sampling)**
● CD audio:	**4Hz-20kHz**
(2) S/N ratio:	
● CD audio:	**115dB**
(3) Dynamic range:	
● DVD (linear audio):	**98dB**
● CD audio:	**97dB**

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(4) Total harmonic distortion:	
● CD audio:	0.008%
Digital audio output:	
Optical digital output:	Mini optical terminal
Number of terminals:	1system (also used for audio output)
Pickup:	
Wave length:	662nm/ 785nm (DVD/CD)
Laser power:	CLASS 2/ CLASS 3A (DVD/CD)
Power supply:	DC 12V (DC IN terminal) / DC 7.2V (Exclusive battery terminal)
Power consumption (Using included AC adaptor):	13W (Unit only: 10W)
Power consumption in Standby mode (Using included AC adaptor):	approx. 0.5W
Power consumption in Recharge mode (Using included AC adaptor):	13W
AC adaptor:	
Power source:	AC 100-240V, 50/60Hz
Power consumption:	28W
DC output:	12V, 1.5A
Battery pack CGR-H702 (lithium ion)(LS-90 included):	
Voltage:	7.2V
Capacity:	4700mAh
Battery pack CGR-H703 (lithium ion)(LS-93 included):	
Voltage:	7.2V
Capacity:	8600mAh
Dimensions (excluding protrusions and battery):	
DVD-LS90:	235.4(W) x 178.6(D) x 39.0*(H) mm [99/32” (W) x 71/32” (D) x 117/32” (H)] *29.9mm (13/16”) at lowest point [D=184.9mm (79/32”) including battery] [H=51.4mm (21/32”) including battery]
DVD-LS93:	235.4(W) x 178.6(D) x 39.0*(H) mm [99/32” (W) x 71/32” (D) x 117/32” (H)] *29.9mm (13/16”) at lowest point [D=201.4mm (715/16”) including battery] [H=51.5mm (21/32”) including battery]
Mass (including battery):	

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DVD-LS90: **1097g (38.69 oz)**

DVD-LS93: **1280g (45.15 oz)**

solder:

This model uses lead free solder (PbF).

Note

Specifications are subject to change without notice.

Mass and dimensions are approximate.

Manufactured under license from Dolby Laboratories.

“Dolby“ and the double-D symbol are trademarks of Dolby Laboratories.

“DTS“ and “DTS 2.0+ Digital Out” are trademarks of Digital Theater Systems, Inc.

Apparatus Claims of U.S. Patent Nos. 4,631,603, 4,577,216, and 4,819,098, licensed for limited viewing uses only.

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WMA is a compression format developed by Microsoft Corporation. It achieves the same sound quality as MP3 with a file size that is smaller than that of MP3.

MPEG Layer-3 audio decoding technology licensed from Fraunhofer IIS and Thomson multimedia.

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Panasonic

1. SAFETY PRECAUTIONS

1.1. GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1M Ω and 5.2M Ω . / When the exposed metal does not have a return path to the chassis, the

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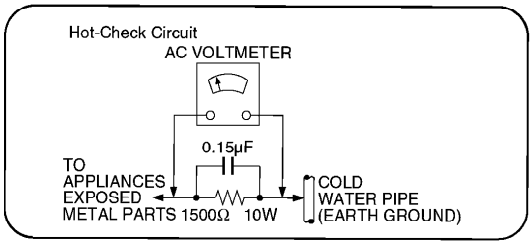
reading must be ∞.

1.1.2. LEAKAGE CURRENT HOT CHECK

1. **Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.**
2. **Connect a 1.5k Ω , 10 watts resistor, in parallel with a 0.15 μ F capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe.**



3. **Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.**
4. **Check each exposed metallic part, and measure the voltage at each point.**
5. **Reverse the AC plug in the AC outlet and repeat each of the above measurements.**
6. **The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.**

2. PREVENTION OF ELECTRO STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. **Immediately before handling any semiconductor component or**

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semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. **After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as alminum foil, to prevent electrostatic charge buildup or exposure of the assembly.**
3. **Use only a grounded-tip soldering iron to solder or unsolder ES devices.**
4. **Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.**
5. **Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.**
6. **Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, alminum foil or comparable conductive material).**
7. **Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.**

   Caution

   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. **Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise hamless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).**

3. PRECAUTION OF LASER DIODE

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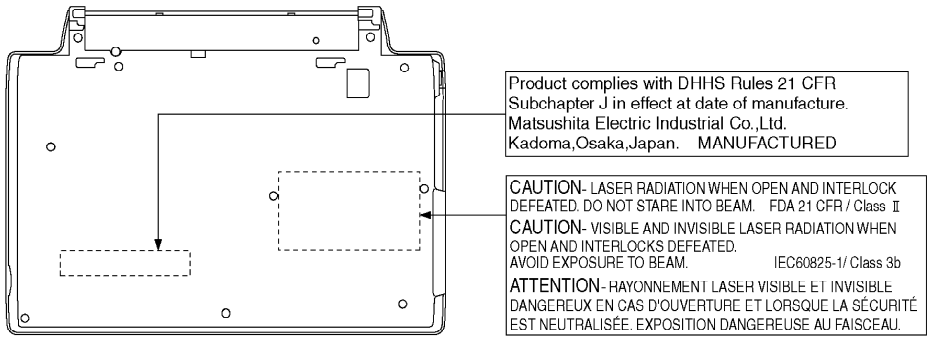
CAUTION:

This product utilizes a laser diode with the unit turned “on”, invisible laser radiation is emitted from the pickup lens.
Wave length:662nm/785nm
Maximum output radiation power from pickup: 100 μ W/VDE
Laser radiation from the pickup lens is safety level,but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.


Product complies with DHHS Rules 21 CFR Subchapter J in effect at date of manufacture.
Matsushita Electric Industrial Co.,Ltd.
Kadoma,Osaka,Japan. MANUFACTURED
CAUTION- LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. DO NOT STARE INTO BEAM. FDA 21 CFR / Class II
CAUTION- VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED.
AVOID EXPOSURE TO BEAM. IEC60825-1/ Class 3b
ATTENTION- RAYONNEMENT LASER VISIBLE ET INVISIBLE DANGEREUX EN CAS D'OUVERTURE ET LORSQUE LA SÉCURITÉ EST NEUTRALISÉE. EXPOSITION DANGEREUSE AU FAISCEAU.

CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

4. HOW TO REPLACE THE LITHIUM BATTERY

This model is using a lithium battery for the remote control ass’y.

NOTE:

The lithium battery is a critical component. (Type No.: CR2025 Manufactured by Panasonic.)
It must never be subjected to excessive heat or discharge.
It must therefore only be fitted in equipment designed specifically for its use.
Replacement batteries must be of the same type and manufacture.
They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.
Do not attempt to re-charge the old battery or re-use it for any other purpose.
It should be disposed of in waste products destined for burial rather than incineration.

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(For English)

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's instructions.

(For French)

PRECAUTION

Le fait de remplacer incorrectement la pile peut présenter des risques d'explosion.
Remplacer la pile uniquement par une pile identique ou de type équivalent recommandée par le fabricant. Se débarrasser des piles usagées conformément aux instructions du fabricant.

5. LITHIUM ION BATTERY

A lithium ion/polymer battery that is recyclable powers the product you have purchased. Please call 1-800-8-BATTERY for information on how to recycle this battery.

L'appareil que vous vous êtes procuré est alimenté par une battene au lithium-ion/lithium-polymère. Pour des renseignements sur le recyclage de la batterie, veuillez composer le 1-800-8-BATTERY.

6. ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution:

- Pb free solder has a higher melting point than standard solder; Typically thmelting point is 50 - 70°F (30 - 40°C) higher. Please use

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a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C).

- Pb free solder will tend to splash when heated too high (about 1100°F/ 600°C).

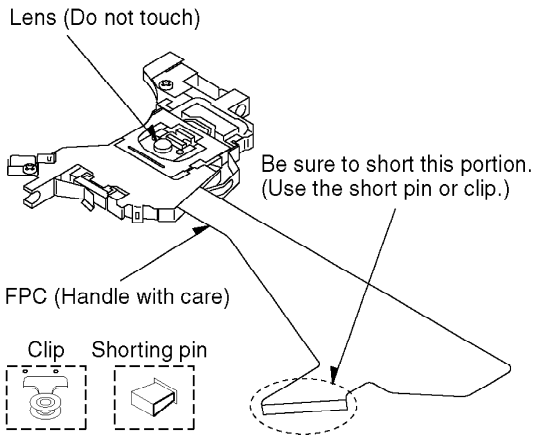
When soldering or unsoldering, please completely remove all of the solder on the pins or solder area, and be sure to heat the soldering points with the Pb free solder until it melts enough.

7. HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So be careful of electrostatic break down during repair of the optical pickup.

7.1. Handling of optical pickup

1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC Board). / When removing or connecting the short pin, finish the job in as short times as possible.
3. Be careful not to apply excessive stress to the flexible board (FPC Board).
4. Do not turn the variable resistor (Laser power adjustment). / It has already been adjusted.



7.2. Grounding for electrostatic breakdown prevention

1. Human body grounding / Use the antistatic wrist strap to discharge the static electricity from your body.

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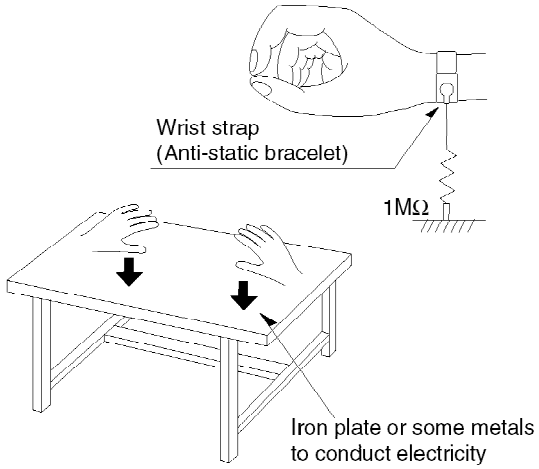
2. Work table grounding / Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed and ground the sheet.

Caution

The static electricity of your clothes will not be grounded through the wrist strap. So take care not to let your clothes touch the optical pickup.



8. DISASSEMBLY, REASSEMBLY AND SERVICE POSITION

Before trying to disassembling, reassembling or replacing parts, make sure the DC receptacle is disconnected; otherwise there is a danger of causing an electrical shock accident or injury.

The laser does not come on when the inner cover is opened.
If the objective lens of the optical pick-up shines in red when the inner cover is opened, turn off the power immediately and check.

If you need to turn on the laser for any reason, such as playback inspection, never look directly at the laser light.

When disassembly of the unit is needed, remove the disk from the unit.
Use caution not to give damage to the LCD surface.

8.1. Disassembly

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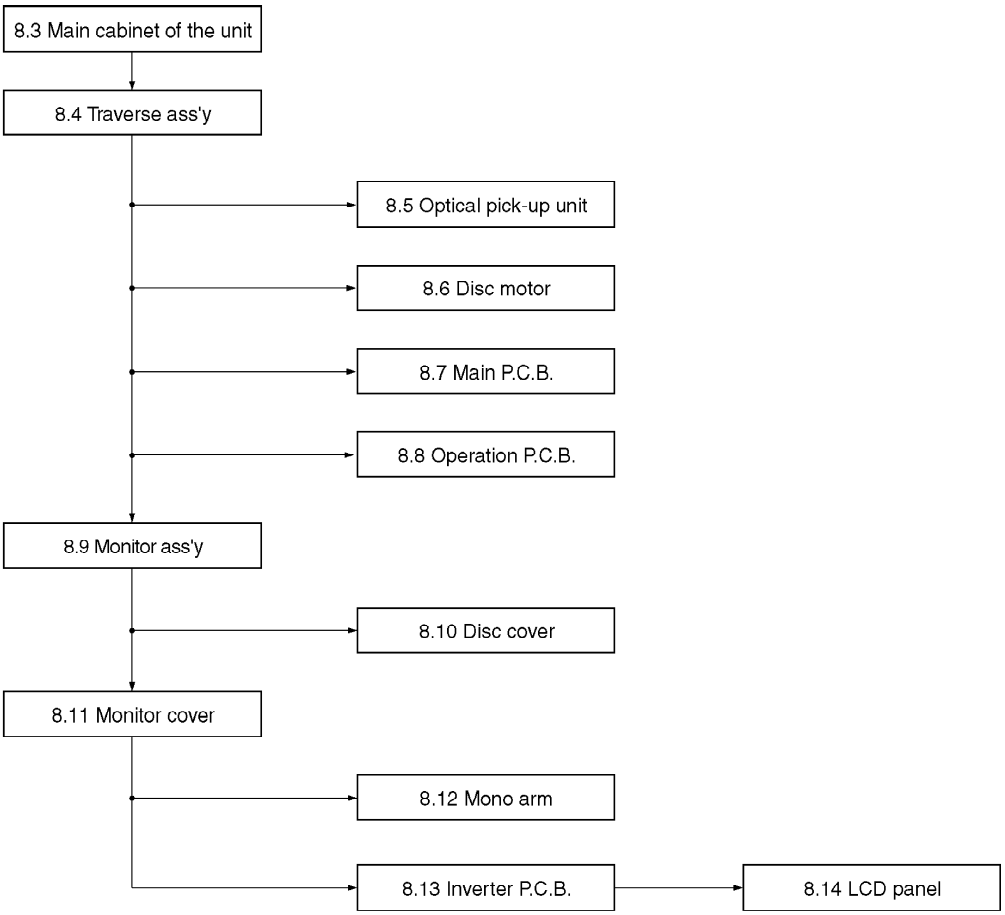

<Caution to be taken when disassembling and reassembling the unit>

- Disconnect the flexible cable from the main P.C.B before disassembling the monitor assembly.
- Do not apply undue force on the flexible cable. There is a danger of breaking the cable.
- Do not touch the terminals of the flexible cable with your bare hands.
- Disassembly and reassembly should be performed in the specified order.
- Hold the LCD panel by its edges.
- Do not press the LCD panel strongly.
  * If the LCD panel was pressed strongly by chance during disassembly or reassembly, leave it for about 10 seconds before energizing the panel.
- To clean the LCD panel, wipe with a soft cloth, such as gauze, saturated with isopropyl alcohol.
  * Do not wipe the LCD panel with a dry gauze.
  * Never use water for cleaning the LCD panel.
  * Never use the following solvents:
  (ketone: acetone and others)
  (aromatic compounds: xylene, toluene)
  (halogenides)
  * If the water splashes on the LCD panel, wipe it away immediately.

8.2. P.C.B. location

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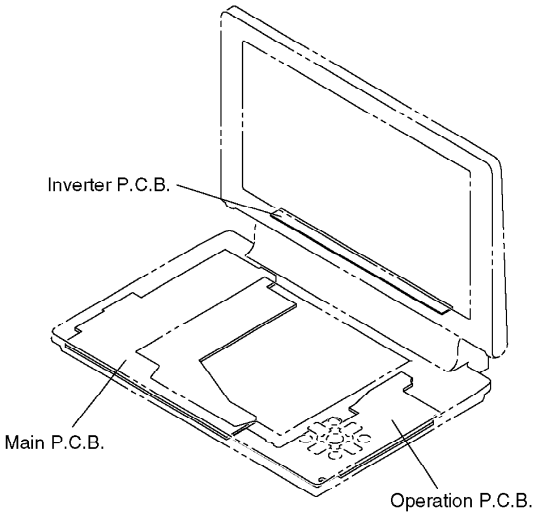
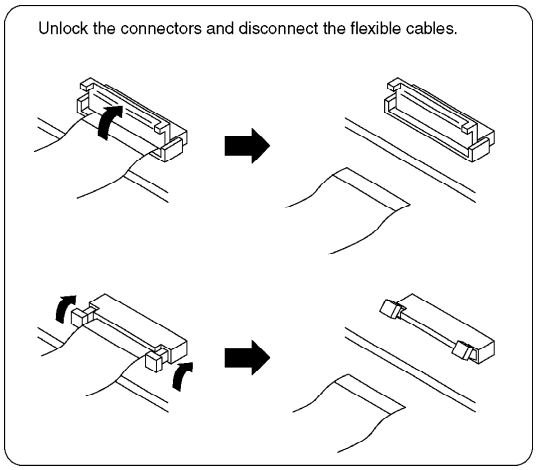
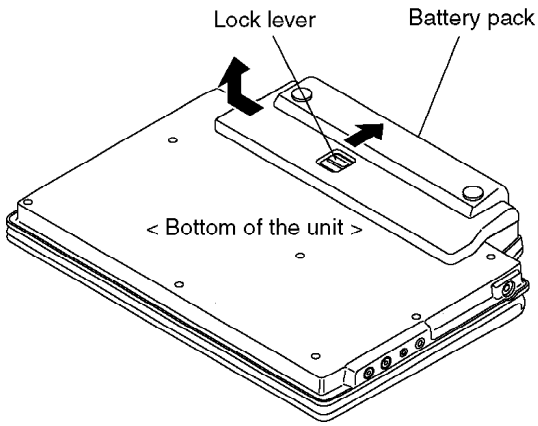


8.3. Main cabinet of the unit



<Removing battery pack>
Release the lock lever and remove the battery pack in the direction of the arrow.



1. Remove the 11 screws from the bottom of the unit.

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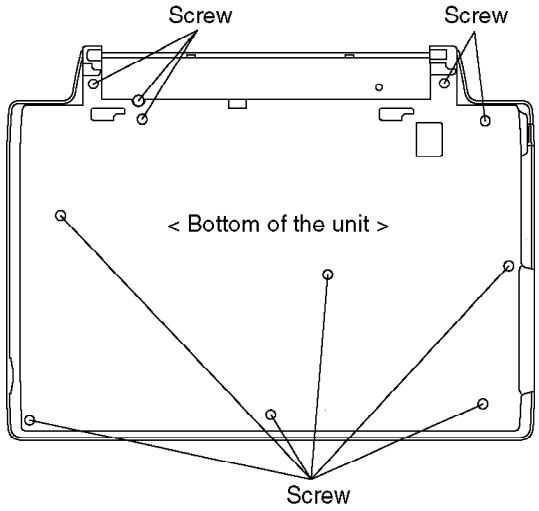
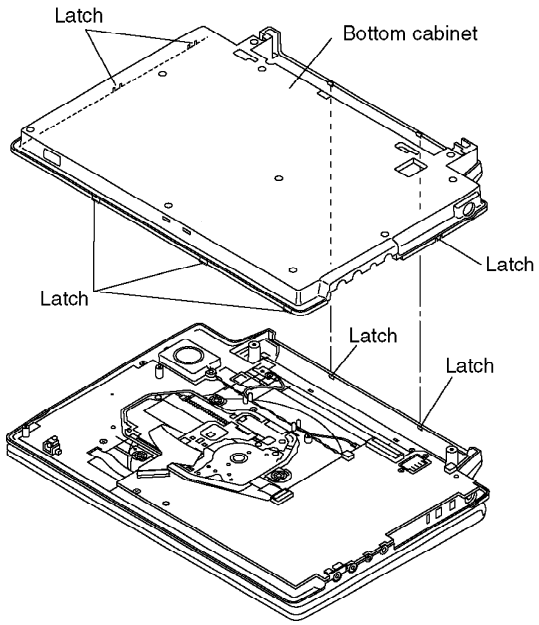


2. Release the latches and remove the bottom cabinet.



8.4. Traverse assembly

> ⚠ Take antistatic measures before servicing the traverse unit and its related devices.

8.4.1. Removing traverse assembly

1. Solder the 2 laser short lands on the flexible cable.

2. Unlock the connectors and remove the flexible cables.

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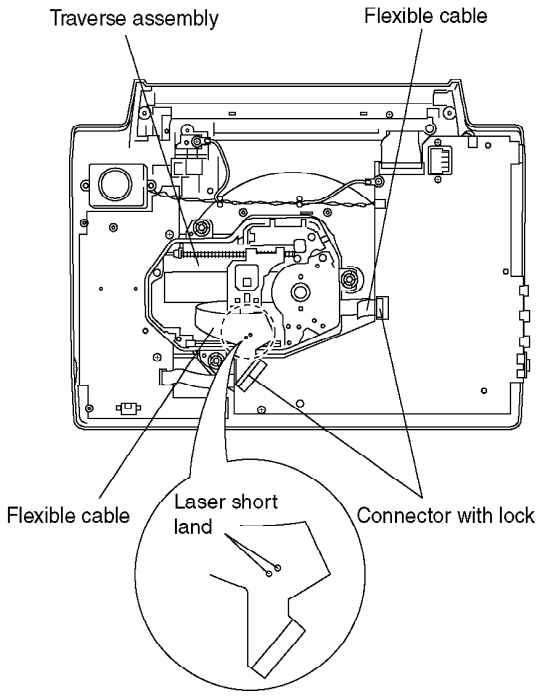

8.4.2. Reinstalling traverse assembly

1. **Reinstall the traverse assembly to the specified pin of the unit.**
2. **Reinstall the flexible cable of the optical pickpup unit and lock it securely.**
3. **Remove the solder of each laser short land of the flexible cable.**
   Caution:
   Remove the solders completely: otherwise the laser diode won't emit light.
4. **Reinstall the spindle flexible cable as shown figure.**

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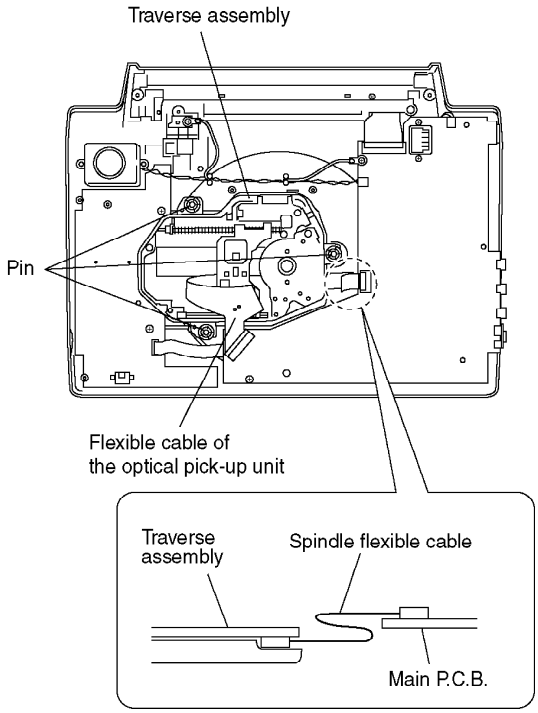

8.5. Optical pick-up unit

8.5.1. Removing optical pick-up unit

Caution to be taken when replacing optical pick-up unit.

1. Take antistatic measures before servicing the optical pick-up unit.
2. Use a clean work bench which is free from dust or foreign matter.
3. Do not replace optical pick-ups other than necessary; otherwise they might not be properly adjusted.
4. When disassembling the traverse unit, use caution not to lose small parts such as screws and springs.

The traverse unit is a precision optical part. Do not touch the lens or give shock to the traverse.

Make sure that the traverse assembly removed before trying to remove the optical pick-up unit. When removing the traverse assembly, solder the two laser short lands on the flexible cable of the optical pick-up unit.

1. Remove the two screws securing the main shaft retainer.

2. Remove the main shaft retainer.

3. Slide the main shaft in the direction indicated by the arrow to

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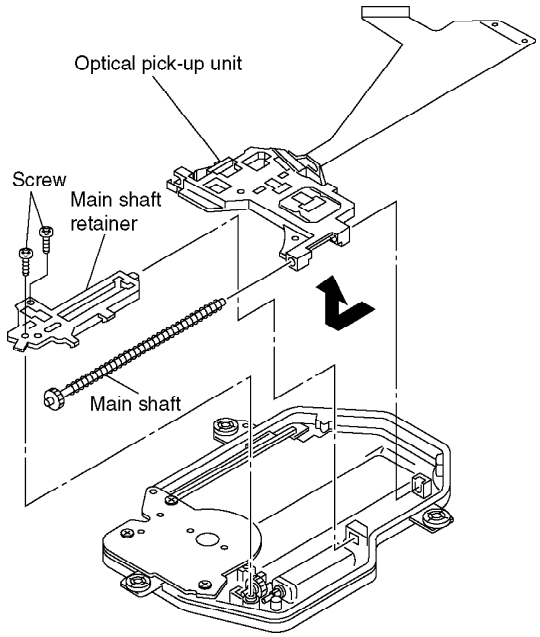
remove the optical pick-up unit.



8.5.2. Reinstalling optical pick-up unit

The optical pick-up unit is factory adjusted. Do not touch the adjustment screw.

1. **Reassemble the disassembled parts in the reverse order of disassembly.**
2. **When reinstalling the traverse assembly on the main unit after installing the optical pick-up unit, make sure to remove the solder from each of the two laser short lands on the flexible cable.**

Caution:

- **Remove the solders completely; otherwise the laser diode won't emit light.**
- **After replacing the optical pick-up unit, check the quality of images played back and make optical adjustment.**

8.6. Disc motor

8.6.1. Removing disc motor

1. **Remove the adjustment screws A, B, and C.**
2. **Remove the disc motor.**

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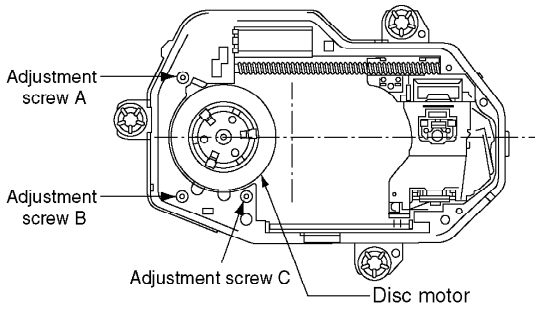


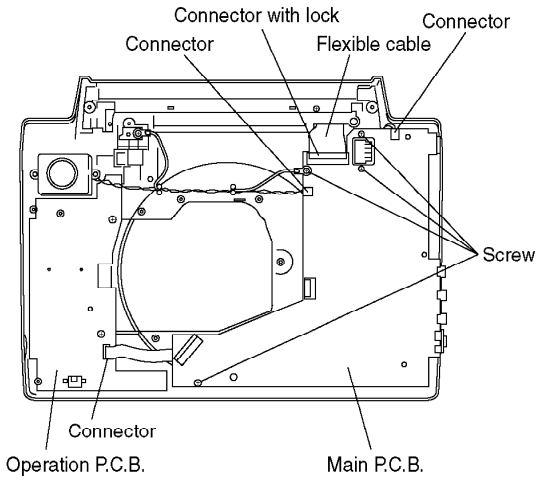
8.6.2. Caution to be taken when replacing the disc motor

1. **The mounting screws of the disc motor also serve as adjustment screws. When reinstalling the disc motor, first turn the screws A, B, and C as far as they go by usual force to secure them (do not overtighten).**
2. **Back off the adjustment screws A and C two complete turns and secure them.**
3. **Back off the adjustment screw B one and a half turns and secure them.**

   - This makes it nearly possible to play back disks and adjust the jitter.
   Thereafter, adjust the adjustment screws C and A as indicated.

8.7. Main P.C.B.

1. **Unlock the connector and remove the flexible cable.**
2. **Remove the 3 connectors.**
3. **Remove the 4 screws and remove the main P.C.B..**



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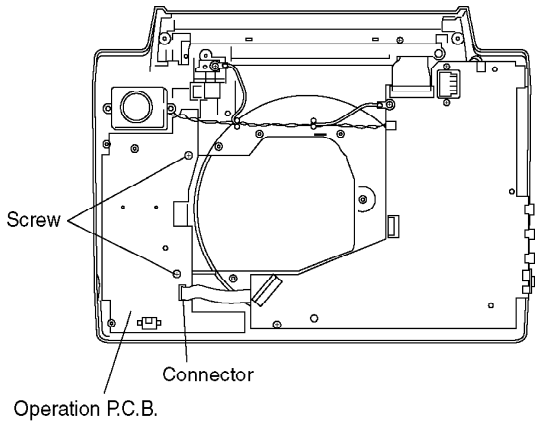
8.8. Operation P.C.B.

1. Remove the connector.

2. Remove the 2 screws and remove the operation P.C.B.

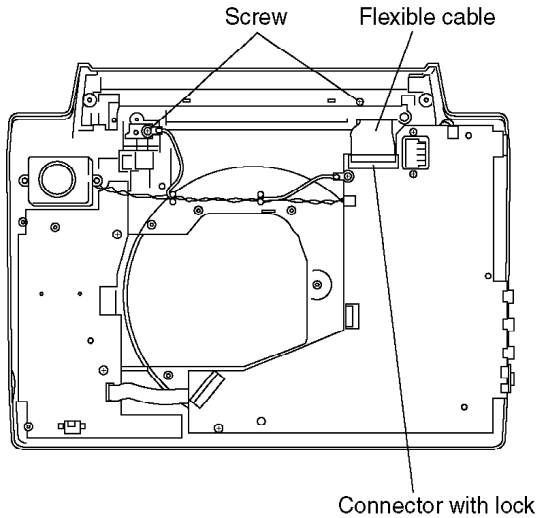


8.9. Monitor assembly

> Take care not to get an electrical shock accident by touching the high-voltage part when checking for conduction after disassembly.
> Do not give damage to the LCD surface.

1. Unlock the connector and remove the flexible cable.

2. Remove the 2 screws.



3. Release the latches and remove the hinge cover.

4. Remove the screw and remove the monitor assembly.

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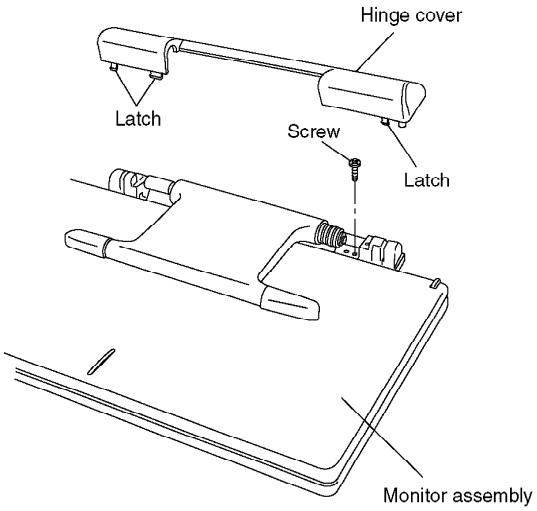
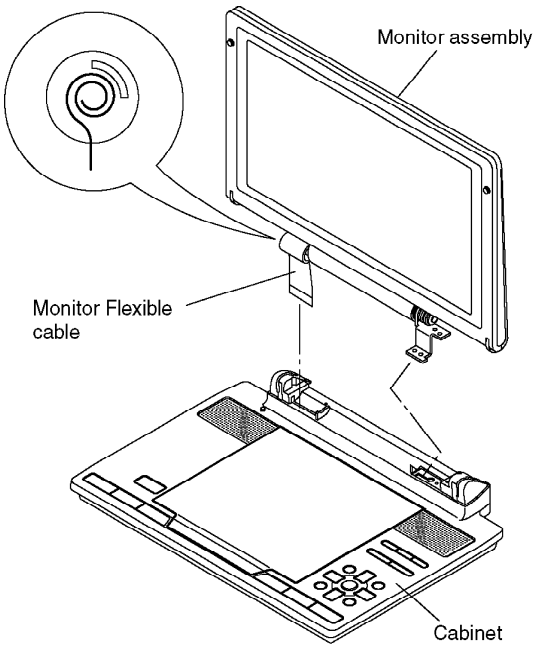


<Caution to be taken when installing monitor assembly>

1. Roll the flexible cable as shown figure.

2. Install the monitor assembly on the cabinet.



8.10. Disc cover

1. Remove the disc cover in order of (a) and (b).

Caution:

Please don't lose the spring

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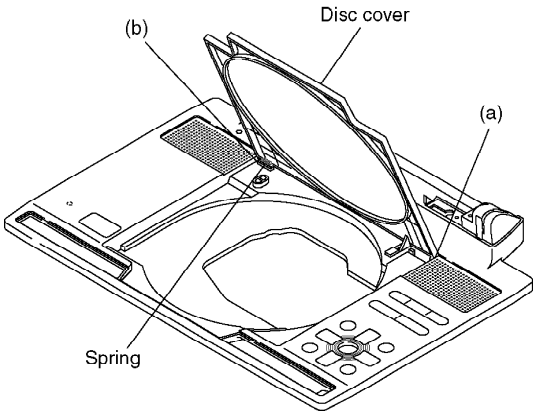
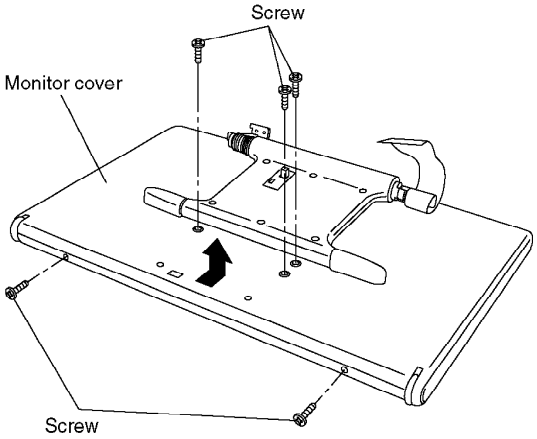


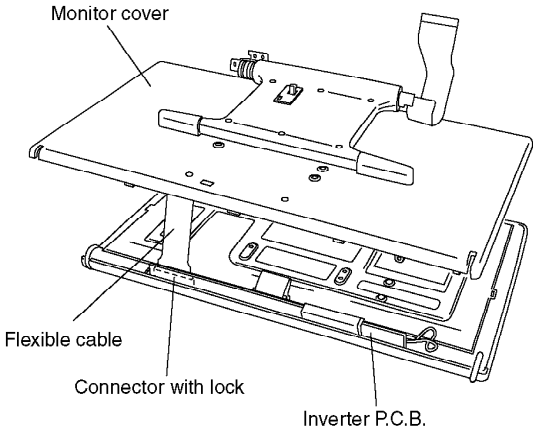
8.11. Monitor cover

1. Remove the 5 screws

2. Remove the monitor cover into the direction of the arrow.



3. Unlock the connector and remove the flexible cable.



<Caution to be taken when installing monitor cover>

Please do not nip the wire.

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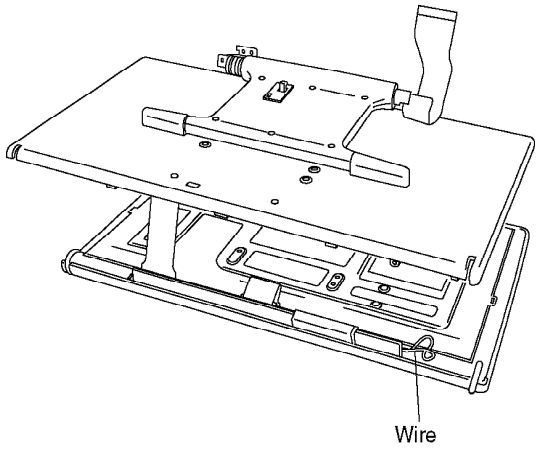
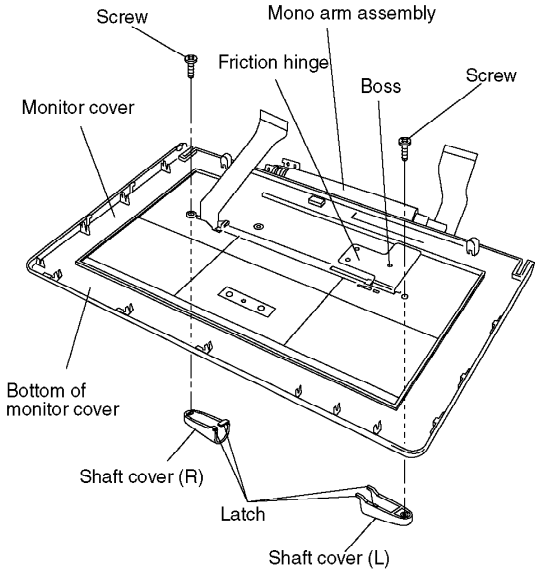
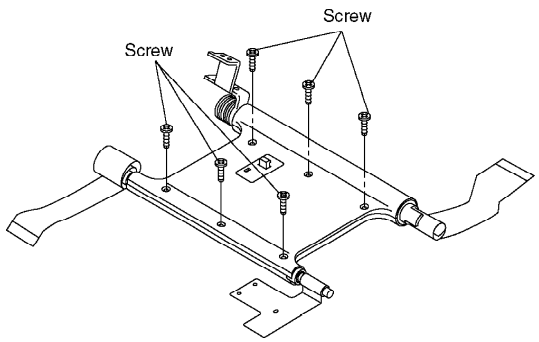


8.12. Mono arm

1. **Remove the 2 screws.**
2. **Release the latches and remove the shaft covers.**
3. **Release the friction hinge from boss and remove the mono arm assembly.**



4. **Remove the 6 screws.**



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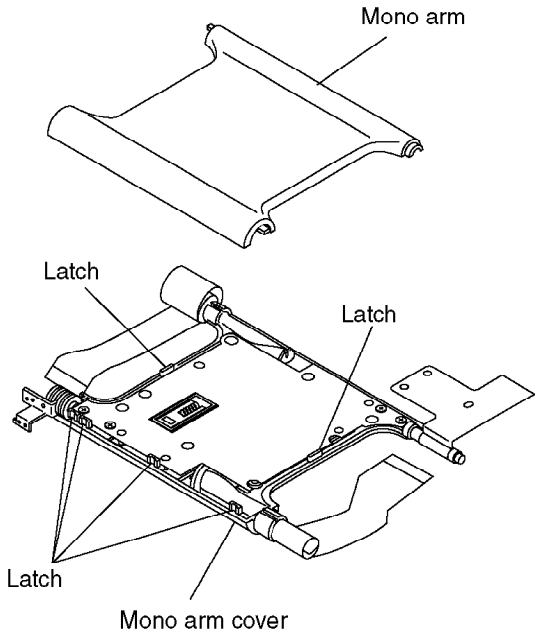
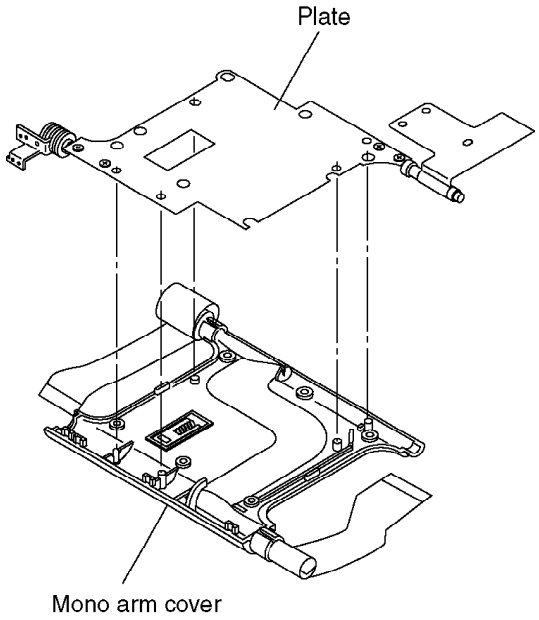
5. Release the latches and remove the mono arm



6. Remove the plate.



<Caution to be taken when installing mono arm>

1. Roll the flexible cables as shown figure and install it to mono arm cover.

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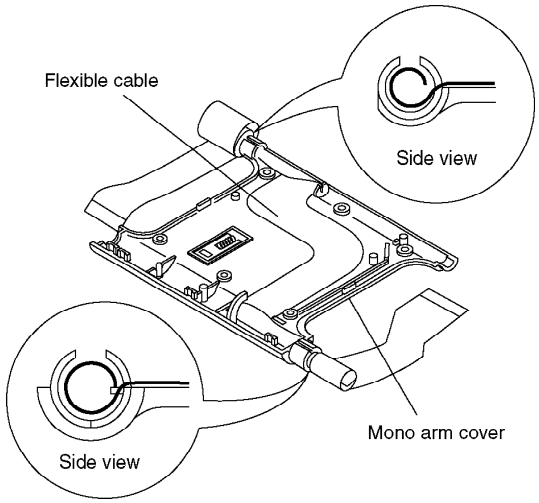
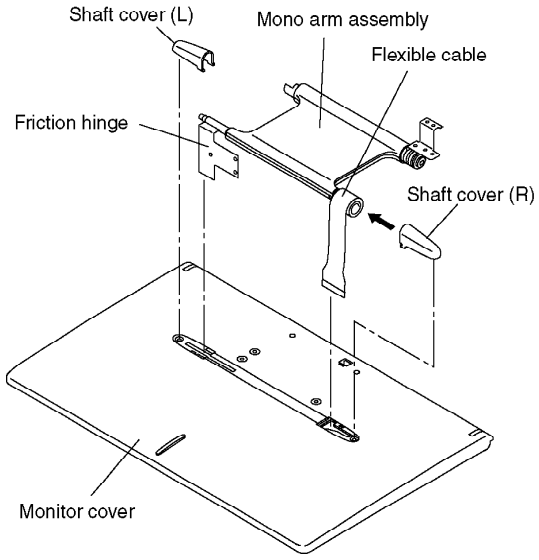


2. Install mono arm.
3. Roll 3 turns of the flexible cable and Install the shaft cover (R) to flexible cable.
4. Pass the flexible cable and the friction hinge into the holes in the monitor cover.
5. Install the shaft covers to monitor cover.



8.13. Inverter P.C.B.

1. Unlock the connector and remove the flexible cable.
2. Remove the connector and remove the inverter P.C.B.

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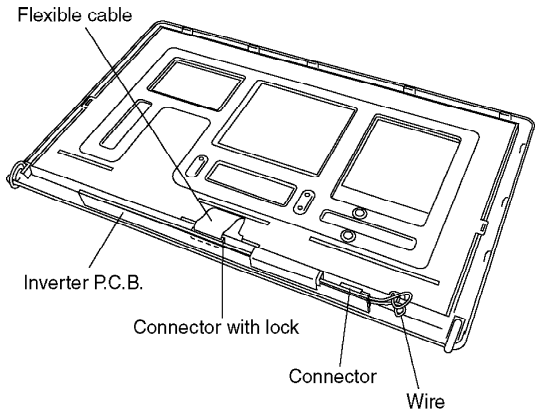
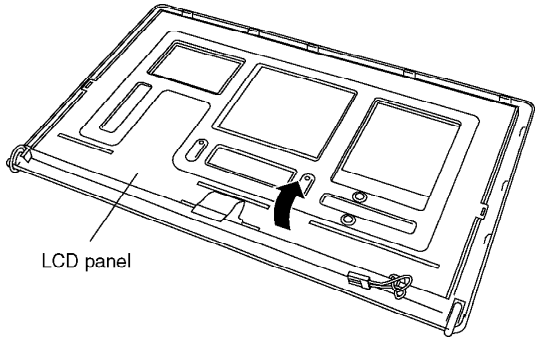


8.14. LCD panel

1. Remove the LCD panel into the direction of the arrow.



8.15. Service position

> If you need to turn on the laser for any reason, such as for playback inspection, never look directly at the laser light.

8.15.1. Board checks

1. Connect the main P.C.B and the traverse assembly with an extension cable.

2. Install the traverse assembly to the tilt adjustment jig using three screws and three washers.

Caution:

- Remove the rubber cushion from the traverse assembly to prevent it from getting damaged.

3. Install a dick on the traverse assembly.

Caution:

- Make sure the disk is securely installed on the disk motor.

4. Remove the main P.C.B., operation P.C.B., inverter P.C.B., and LCD panel as shown below.

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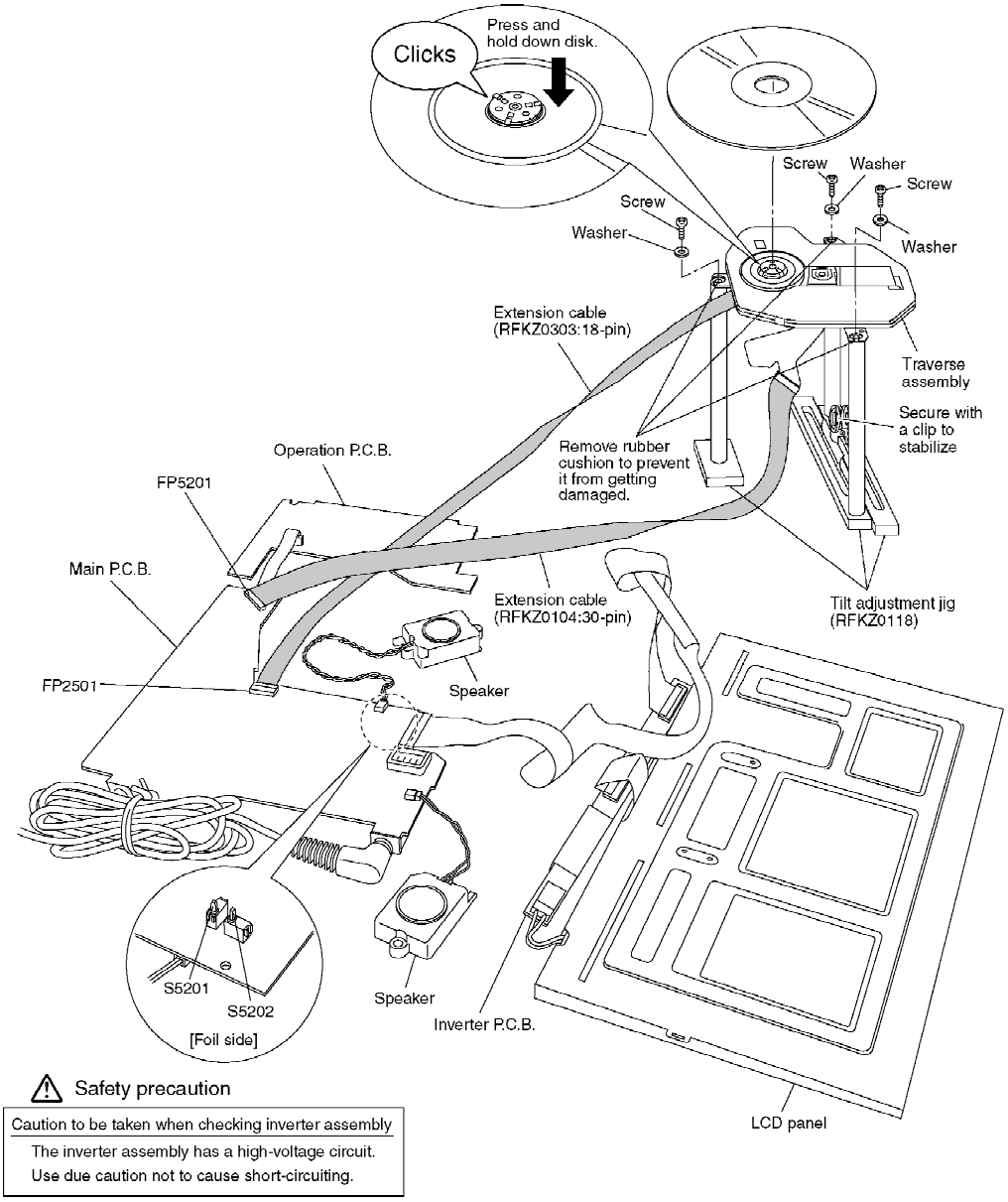
5. The disk cannot be played back with the disk cover removed. Press and hold down the S5201 and S5202. (Secure with cellulose tape.)



9. SELF-DIAGNOSIS FUNCTION AND SERVICE MODE

9.1. Optical Pickup Breakdown Diagnosis

As a new feature, this unit has an “optical pick-up problem diagnosis function” and “a tilt adjustment confirmation function” built in. Use the following procedure to efficiently determine the problem and adjust tilt.If "NO DISC" is displayed, before exchanging the optical pick-up, carry out problem diagnosis first. If the present laser driving current is over 55, the optical pick-up may need to be exchanged.

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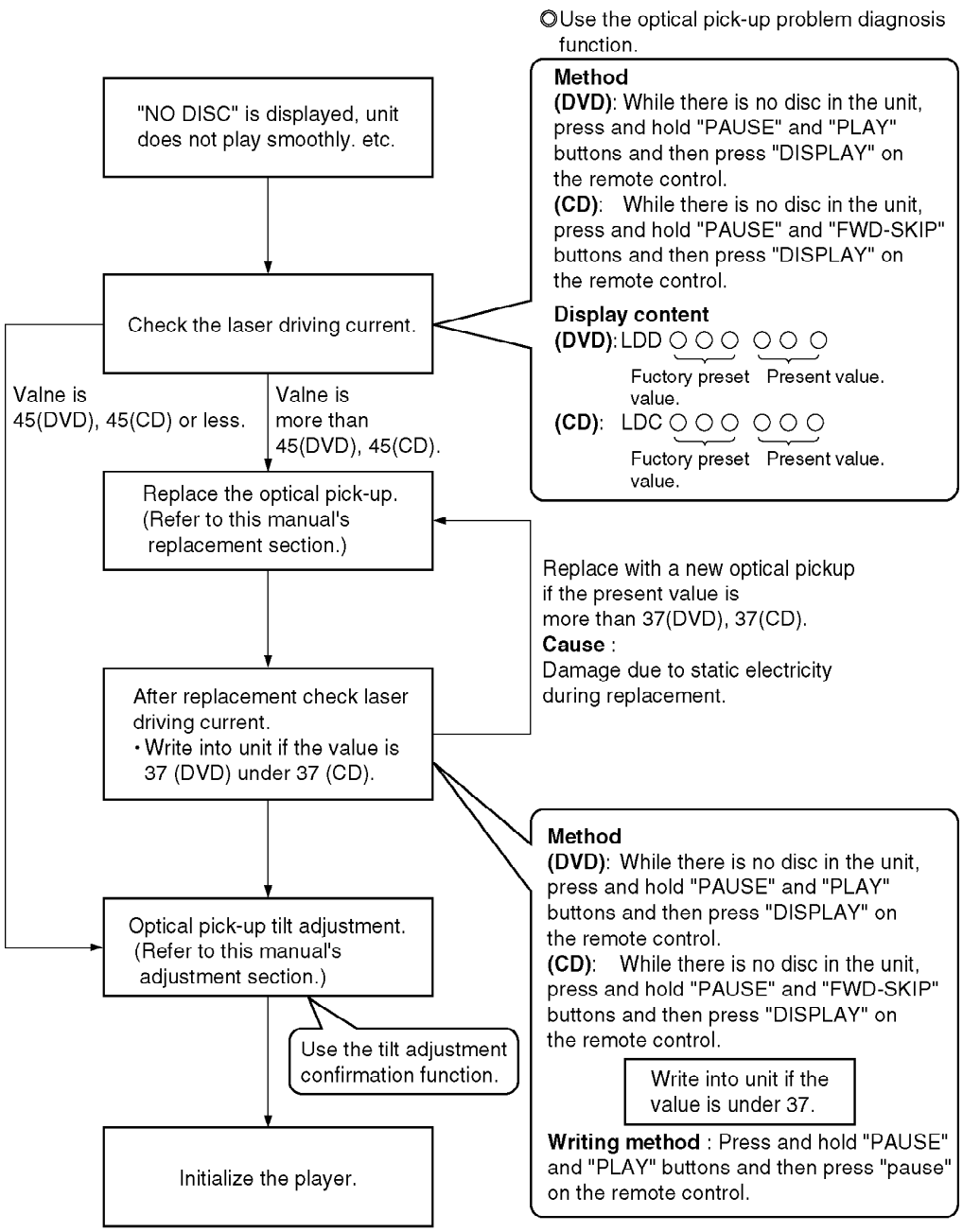
◎Use the optical pick-up problem diagnosis function.
"NO DISC" is displayed, unit does not play smoothly. etc.
Check the laser driving current.
Method
(DVD): While there is no disc in the unit, press and hold "PAUSE" and "PLAY" buttons and then press "DISPLAY" on the remote control.
(CD): While there is no disc in the unit, press and hold "PAUSE" and "FWD-SKIP" buttons and then press "DISPLAY" on the remote control.
Display content
(DVD): LDD ○ ○ ○ ○ ○ ○
Fuctory preset value.
Present value.
(CD): LDC ○ ○ ○ ○ ○ ○
Fuctory preset value.
Present value.
Valne is 45(DVD), 45(CD) or less.
Valne is more than 45(DVD), 45(CD).
Replace the optical pick-up. (Refer to this manual's replacement section.)
Replace with a new optical pickup if the present value is more than 37(DVD), 37(CD).
Cause :
Damage due to static electricity during replacement.
After replacement check laser driving current.
・Write into unit if the value is 37 (DVD) under 37 (CD).
Method
(DVD): While there is no disc in the unit, press and hold "PAUSE" and "PLAY" buttons and then press "DISPLAY" on the remote control.
(CD): While there is no disc in the unit, press and hold "PAUSE" and "FWD-SKIP" buttons and then press "DISPLAY" on the remote control.
Write into unit if the value is under 37.
Writing method : Press and hold "PAUSE" and "PLAY" buttons and then press "pause" on the remote control.
Optical pick-up tilt adjustment. (Refer to this manual's adjustment section.)
Use the tilt adjustment confirmation function.
Initialize the player.

Note:

Carry out diagnosis within 3 minutes of turning the unit on. (The player's current can increase as it warms up, so turn the unit off and allow it to cool down before diagnosis.)

Cautions to be taken when replacing the optical pickup

The optical pickup may break down due to the static electricity of human body. Take proper protection measures against static electricity before repairing the parts around the optical pickup. (See the page describing the PREVENTION OF STATIC ELECTRICITY DISCHARGE.)

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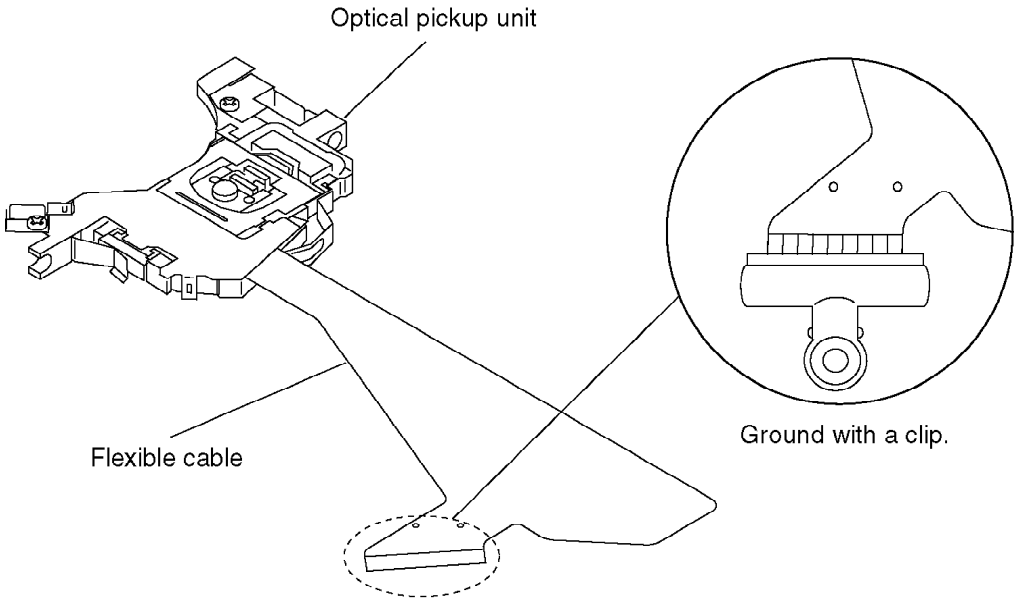
1. **Do not touch the areas around the laser diode and actuator.**
2. **Do not judge the laser diode with a tester. (The tester will be damaged easily.)**
3. **It is recommended to use a destaticized soldering iron for short-circuiting or removing the laser diode. (Recommended soldering iron) HAKKO ESD Product**
4. **Solder the land of the flexible cable in the optical pickup.**

Note:

- **When using a soldering iron which is not destaticized, short-circuit the terminal face of the flexible case with a clip. After that, short-circuit the land.**
- **After the repairing work is completed, remove the solder according to the correct procedure shown in this Technical Guide.**



9.2. UHF displays

Use the internal service mode for evaluation of malfunctions.

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Display Method	Display	Diagnosis
Items displayed when in use	CHECK THE DISC	Focus error
	H01	Inner cover trouble
	H02	Spindle servo error
	H03	Traverse error
	H04	Tracking servo error
	H05	Seek error
Press the "0" button on the remote control while holding down the PAUSE and PLAY buttons on the player. The last error code generated is saved in the EEPROM	F0**	Disc format error
	F1**	Disc code error
	F2**	Decoder LSI error
	F5**	DSC
	F6**	ECC error
	F7**	Microcomputer error
	F8**	Microcomputer error

9.3. Service Mode Table 1

The service modes can be activated by pressing various button combination on the player and remote control unit.

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Player buttons	Remote control unit buttons	Application	N
PAUSE / + / PLAY	0	Displaying the UHF display F_ _ _	Refer to 9.2. Self- Diagnos Functior Display)
	5	Jitter check, tilt adjustment *Display shows xx_yyyzz "xx" and "zz" shown to the right have nothing to do with the jitter value. "xx" is the error counter, while "zz" is the focus drive value. Refer to section 11.4. for Optical Pickup Tilt Adjustment Procedure.	Refer to 11.4. Op Pickup T Adjustm
	6	Checking the region numbers and broadcast system	
	7	Checking the program version	Check th FLASH I program
	9	Lighting Confirmation Function of Display Tube	
	DISPLAY	Checking the laser drive current	Refer to 8.5. Opti Pickup Replace Procedu
	PAUSE	Writing the laser drive current value after replacing the optical pickup (do not use for anything other than optical pickup replacement)	

Player buttons	Remote control unit buttons	Application	N
PAUSE BWD-SKIP PLAY	—	The user setting is returned to the state of the factory shipment.	Refer to 9.6. Initi DVD pla

9.4. DVD Self Diagnostic Function-Error Code

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Error Code	Error Content	Additional error explanation	Defect 1	Defect 2	Defect 3
	U, H error				
U11	Focus error				
H01	Tray loading error				
H02	Spindle servo error	(Spindle servo, DSC SP motor, CLV servo error)			
H03	Traverse servo error				
H04	Tracking servo error				
H05	Seek error				
H06	Power error	Cannot switch off the power because of the panel and system computer communication error			
H07	Spindle motor drive error				
	DSC related				
F500	DSC error	DSC stops in the occurence of servo error (starup, focus error, etc)	OPU	DV2 (IC3001)	DV2 (IC3001)
F501	DSC not Ready	DSC-system computer communication error (Communication failure caused by idling of DSC)	DV2 (IC3001)	DV2 (IC3001)	
F502	DSC Time out error	Similar disposal as F500	OPU	DV2 (IC3001)	DV2 (IC3001)
F503	DSC communication Failure	Communication error (result error occured although communication command was sent)	DV2 (IC3001)	DV2 (IC3001)	EEPROM (IC6351)
F505	DSC Attention error	Similar disposal as F500	OPU	DV2 (IC3001)	DV2 (IC3001)
F506	Invalid media	Disc is flipped over, TOC unreadable, incompatible disc	DISC	DV2 (IC3001)	DV2 (IC3001)
	ODC related				
F600	Access failure to management information caused by demodulation error	Operation stopped because navigation data is not accessible caused by the demodulation defect	DV2 (IC3001)	DV2 (IC3001)	DV2 (IC3001)
F601	Indeterminate sector ID requested	Operation stopped caused by the request to access abnormal ID data	DV2 (IC3001)	DV2 (IC3001)	DV2 (IC3001)

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Error Code	Error Content	Additional error explanation	Defect 1	Defect 2	Defect 3
F602	Access failure to LEAD-IN caused by demodulation error	LEAD IN data unreadable			
F603	Access failure to KEYDET caused by demodulation error	Access failure to CSS data of disc			
F610	ODC abnormality	No permission for command execution	DV2 (IC3001)		
F611	6626 QCODE don't read Error	Access failure to seek address in CD series	DV2 (IC3001)		
F612	No CRC OK for a specific time	Access failure to ID data in DVD series	DV2 (IC3001)		
F630	No reply to KEY DET enquiry	(for internal use only)			
F631	CPPM KEY DET is not available till the FILE terminal	(CPPM file system is unreadable caused by scratches)	DISC	CPPM	
F632	CPPM KEY DET is not available	Been revoked or falsified	DISC	EEPROM (IC6351)	CPPM (*1)
	Disc code				
F103	Illegal highlight Position	Big possibility of disc specification violation during highlight display	DISC		
	HIC Error				
F4FF	Force initialize failure (time out)		EEPROM (IC6351)	DV2 (IC3001)	DV2 (IC3001)
	Micro computer error				
F700	MBX overflow	When replying message to disc manager			
F701	Message command does not end	Next message is sent before replying to disc manager			
F702	Message command changes	Message is changed before it is sent as a reply to disc manager			
F880	Task number is not appropriate	Message coming from a non-existing task			

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Error Code	Error Content	Additional error explanation	Defect 1	Defect 2	Defect 3
F890	Sending message when message is being sent to AV task	Sending message to AV task			
F891	Message couldn't be sent to AV task	Begin sending message to AV task			
F893	FROM falsification		FROM (IC6301)	DV2 (IC3001)	
F894	EEPROM abnormality		EEPROM (IC6351)	Serial / communication on lone	
F895	Language area abnormality	Firm version agreement check for factory preset setting failure prevention	FROM (IC6301)		
F896	No existence model	Firm version agreement check for factory preset setting failure prevention	FROM (IC6301)		
F897	Initialize is not completed	Initialize completion check for factory preset setting failure prevention			
F8A0	Message command is not appropriate	Begin sending message to AV task			

Note:
An error code will be canceled if a power supply is turned OFF.
***1: CPPM is the copy guard function beforehand written in the disc for protection of copyrights.**

9.5. Last Error Code saved during NO PLAY

Error code	Error Content
F0BF	6) Cannot playback because physical layer is not recoginizable
F0C0	8) DVD: Cannot playback because it is not DVD Video/Adio /VR
F0C1	9) DVD: Prohibited by the restricted region code
F0C2	A) DVD: PAL restricted playback
F0C3	B) DVD: Parental lock setting prohibits the playback of the entire title
F0C4	C) VCD: Prohibited because it is in PHOTO CD fromat
F0C5	VCD/CD: Prohibited because it is CDROM without CD-DA

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9.6. Service mode table

Pressing various button combinations on the player and remote control unit can activate the service modes.

Item	Player mode and button combination	Function	Display	Cancellation method
Jitter check	In PLAY mode, press PAUSE and PLAY buttons on the player, and "5" button on the remote control unit.	Jitter check Jitter rate is measured and displayed. Measurement is repeatedly done in the cycle of one second. Read error counter starts from zero upon mode setting. When target block data failed to be read out, the counter advances by one increment. When the failure is caused by minor error, it may be corrected when retried to enable successful reading. In this case, the counter advances by one. When the error persists even after retry, the counter may jump by two or more.	J _xxx_yyy_zz Focus drive value Read error counter Jitter rate Jitter check mode Jitter rate is shown in decimal notation to one place of decimal. Focus drive value is shown in hexadecimal notation.	Press STOP or OPEN button.
Error code check	In ** (no disc) mode, press PAUSE and PLAY buttons on the player, and "0" button on the remote control unit. * With pointing of cursor up and down on display, the panel controller switches serial number of history and sends out the command accordingly.	Error code check The latest error code stored in EEPROM is displayed.	Error code (play_err) is expressed in the following convention. Error code = 0 x DAXX is expressed: -> nn UXX Error code = 0 x DBXX is expressed: -> nn HXX Error code = 0 x DXXX is expressed: -> nn FXXX Error code = 0 x 0000 is expressed: -> nn F--- * "nn" denotes the serial number of history.	Cancelled automatically 5 seconds later.
Initial setting of laser drive current	In STOP (no disc) mode, press PAUSE and PLAY buttons on the player, and PAUSE button on the remote control unit.	Initial setting of laser drive currentInitial current value for each of DVD laser and CD laser is separately saved in EEPROM.	LDO_034_028 CD laser current measurement DVD laser current measurement Laser current measurement mode The value denotes the current in decimal notation. The above example shows the initial current is 34mA and 28mA for DVD laser and CD laser respectively when the laser is witched on.	Cancelled automatically 5 seconds later.
DVD laser drive current measurement	In STOP (no disc) mode, press PAUSE and PLAY buttons on the player, and DISPLAY button on the remote control unit.	DVD laser drive current measurement ·DVD laser drive current is measured and the result is displayed together with the initial value stored in EEPROM. After the measurement, DVD laser emission is kept on. It is turned off when POWER key is switched off. (It is also turned off when the primary power is switched off.)	LDD_034_032 Measured current Initial current stored in EEPROM DVD laser current measurement mode The value denotes the current in decimal notation. The above example shows the initial current is 34mA and the measured value is 32mA.	Cancelled automatically 5 seconds later.
ADSC internal RAM data check	In ** (no disc) mode, press PAUSE and PLAY buttons on the player, and RETURN button on the remote control unit.	ADSC internal RAM data check ·ADSC internal RAM data is read out and displayed. Change the address with CLEAR key operation to show the data for 11 addresses.	A_DFA_6901 RAM data for specified address Address ADSC internal RAM data check mode The value is shown in hexadecimal notation. The above example shows the data in ADSC address DFAh is 6901h.	Press STOP or OPEN button.
CD laser drive current measurement	In STOP (no disc) mode, press PAUSE and FWD-SKIP buttons on the player, and DISPLAY button on the remote control unit.	CD laser drive current measurement CD laser drive current is measured and the result is displayed together with the initial value stored in EEPROM. After the measurement, CD laser emission is kept on. It is turned off when POWER key is switched off. (It is also turned off when the primary power is switched off.)	LDC_028_026 Measured current Initial current stored in EEPROM CD laser current measurement mode The value denotes the current in decimal notation. The above example shows the initial current is 28mA and the measured value is 26mA.	Cancelled automatically 5 seconds later.

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Item	Player mode and button combination	Function	Display	Cancellation method
Version display	In STOP (no disc) mode, press PAUSE and PLAY buttons on the player, and "7" button on the remote control unit.	Version display	srrr_xxyzzz System controller release number System controller model number System controller generation Panel controller release number Panel controller model number	Cancelled automatically 5 seconds later.
Lighting of display tube	In STOP (no disc) mode, press PAUSE and PLAY buttons on the player, and "9" button on the remote control unit.	Lighitng of display tube	_____	Press PAUSE and PLAY buttons on the player, and "9" button on the remote control unit.
Initialization	In STOP (no disc) mode, press PAUSE, BWD-SKIP and PLAY buttons on the player for 3 seconds or longer.	Initialization User settings are cancelled and player is initialized to factory setting.	Initialized	
Region display	In STOP (no disc) mode, press PAUSE and PLAY buttons on the player, and "6" button on the remote control unit.	Region display	x__y-y__zzz Panel controller jumper information N: NTSC / 6: PAL60 N: noPAL / P: PAL Region No.	Cancelled automatically 5 seconds later.

Item	Player mode and button combination	Function	Display	Cancellation method
Timer 1 check	In STOP (no disc) mode, press PAUSE and FWD-SKIP buttons on the player, and "5" button on the remote control unit.	Timer 1 check Laser operation timer Operation time is measured separately for DVD laser and CD laser.	T1_1234_5678 Shown to the left is DVD laser time, and to the right CD laser time. Time is shown in 4 digits of decimal notation in a unit of 10 hours. "0000" will follow "9999".	Cancelled automatically 5 seconds later.
Timer 1 reset	While displaying Timer 1 data, press STOP and FWD-SKIP buttons on the player, and "5" button on the remote control unit.	Timer 1 reset Laser operation timer Operation time of both DVD laser and CD laser is reset all at once.	T1_0000_0000	Cancelled automatically 5 seconds later.
Timer 2 check	In STOP (no disc) mode, press PAUSE and FWD-SKIP buttons on the player, and "6" button on the remote control unit.	Timer 2 check Spindle motor operation timer	T2_123456 Time is shown in 6 digits of decimal notation in a unit of 10 hours. "000000" will follow "999999".	Cancelled automatically 5 seconds later.
Timer 2 reset	While displaying Timer 2 data, press STOP and FWD-SKIP buttons on the player and "6" button on the remote control unit.	Timer 2 reset Spindle motor operation timer	T2_000000	Cancelled automatically 5 seconds later.

9.7. Lens cleaning

When cleaning the lens, use the lens cleaner which product part No. SZZP1038C.

10. SERVICE PRECAUTIONS

10.1. Recovery after the dvd player is repaired

- When FROM or main P.C.B. is replaced, carry out the recovery processing to optimize the drive.
Playback the recovery disk to process the recovery automatically.

- Recovery disc (Product number: RFKZD03R004)

- Performing recovery

1. **Load the recovery disc RFKZD03R004 on to the player and run it.**
2. **Recovery is performed automatically. When it is finished, a message appears on the screen.**
3. **Remove the recovery disc.**
4. **Turn off the power.**

Note:

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This unit requires no initialization process carried out after the traditional DVD players were repaired.
When the recovery measures are taken, the customer setting will return to the factory setting as same as the procedure described in item of "Initialization" in 9.6. is carried out. Write down the contents of the setting before recovery processing, and reset the player.

10.2. Firmware version-up of the DVD player

- The firmware of the DVD player may be renewed to improve the quality including operationability and playerbility to the substandard discs.processing to optimize the drive.
  The recovery disc has also firmware version-up.
- After version-up, recovery processing is executed automatically.
- Part number of the recovery disc for version-up will be noticed when it is supplied.
- Updating firmware

1. Load the recovery disc that is supplied to the player and run it.
2. Firmware version of the player is automatically checked.
   Appropriate message appears whenever necessary.
3. Using remote controller's cursor key, select whether version updating is to be done or not. (Selection of Yes/No)
4. a. If Yes is selected, version updating is performed.
   b. If No is selected, only recovery is performed.
5. a. When updating is finished, remove the disc according to the message appearing on the screen.
   b. Remove the disc according to the message appearing on the screen.
6. Turn off the power.

Note:
If the AC power supply is shut out during version-up due to a power failure, the version-up is improperly carried out.
In such a case, replace the FROM and carry out the version-up again.

11. ADJUSTMENT PROCEDURES

<Caution>

Be sure to take static electricity countermeasures before adjusting the optical system. Adjust the optical systems according to the prescribed procedure.

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11.1. Service Tools and Equipment

Application	Name	Number
Tilt adjustment	DVD test disc	DVDT-S15 or DVDT-S01
Inspection	Extension cable (Traverse ass'y to main P.C.B.)	RFKZ0104 (30Pin)
	Extension cable (Traverse ass'y to main P.C.B.)	RFKZ0303 (18Pin)
	Tilt adj. jig	RFKZ0118
Others	Screw lock	RZZ0L01
	Grease	JGS0101
	Lubricating oil	RFKXGUD24
Confirmation	CD test disc	PVCD-K06 or any other commercially available disc
	VCD test disc	PVCD-K06 or any other commercially available disc
	Recovery disc	RFKZD03R004

11.2. Important points in adjustment

11.2.1. Important points in optical adjustment

- Optical pickup tilt adjustment is needed after replacement of the following components.

1. Optical pickup unit

2. Disc motor

3. Traverse motor

4. Optical pickup peripheral parts (such as rail)

Notes
Adjustment is generally unnecessary after replacing other parts of the traverse unit. However, make adjustment if there is a noticeable degradation in picture quality.
Optical adjustments cannot be made inside the optical pickup.

11.2.2. Important points in electrical adjustment

- Follow the adjustment procedures described in this Manual.

11.3. Storing and Handling Test Discs

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-Surface precision is vital for DVD test discs. Be sure to store and handle them carefully.

1. Do not place discs directly onto the workbench, etc., after use.
2. Handle discs carefully in order to maintain their flatness. Place them into their case after use and store them vertically. Store discs in a c place where they are not exposed to direct sunlight or air from air conditioners.
3. Accurate adjustment will not be possible if the disc is warped when placed on a surface made of glass, etc. If this happens, use a new te disc to make optical adjustments.
4. If adjustment is done using a warped disc, the adjustment will be incorrect and some discs will not be playable.

11.4. Optical adjustment

11.4.1. Optical pick gate adjustment

Measurement point	Adjustment point	Mode	Disc
-----	Tangential adjustment screw (Adjustment screw A) Radial tilt adjustment screw (Adjustment screw B)	Tracking servo "ON" Tracking servo "ON"	DVDT-S01/S15
Measuring apparatus		Adjustment value	
None (Use the service indication on the main unit)		Adjust the jitter value to the minimum level.	

Remove the solder shorts before trying to make the adjustment.

11.4.1.1. Preparations

1. **Connect the main P.C.B. to the traverse ass'y with the extension cable.**
2. **Install the traverse ass'y to the tilt adjustment jig with three screws and three washers.**
   Caution
   Remove the rubber cushion of the traverse ass'y.
3. **Install the traverse ass'y to the disc.**
   Caution
   Make sure the disc is installed on the disc motor securely.
4. **Disassemble the Main P.C.B., Operation P.C.B., Inverter P.C.B. and LCD panel as shown in figure below.**
5. **The disc cannot be played back with the Disc cover attached. Press and hold down the S5201 and S5202 (Secure with cellulose tape)**

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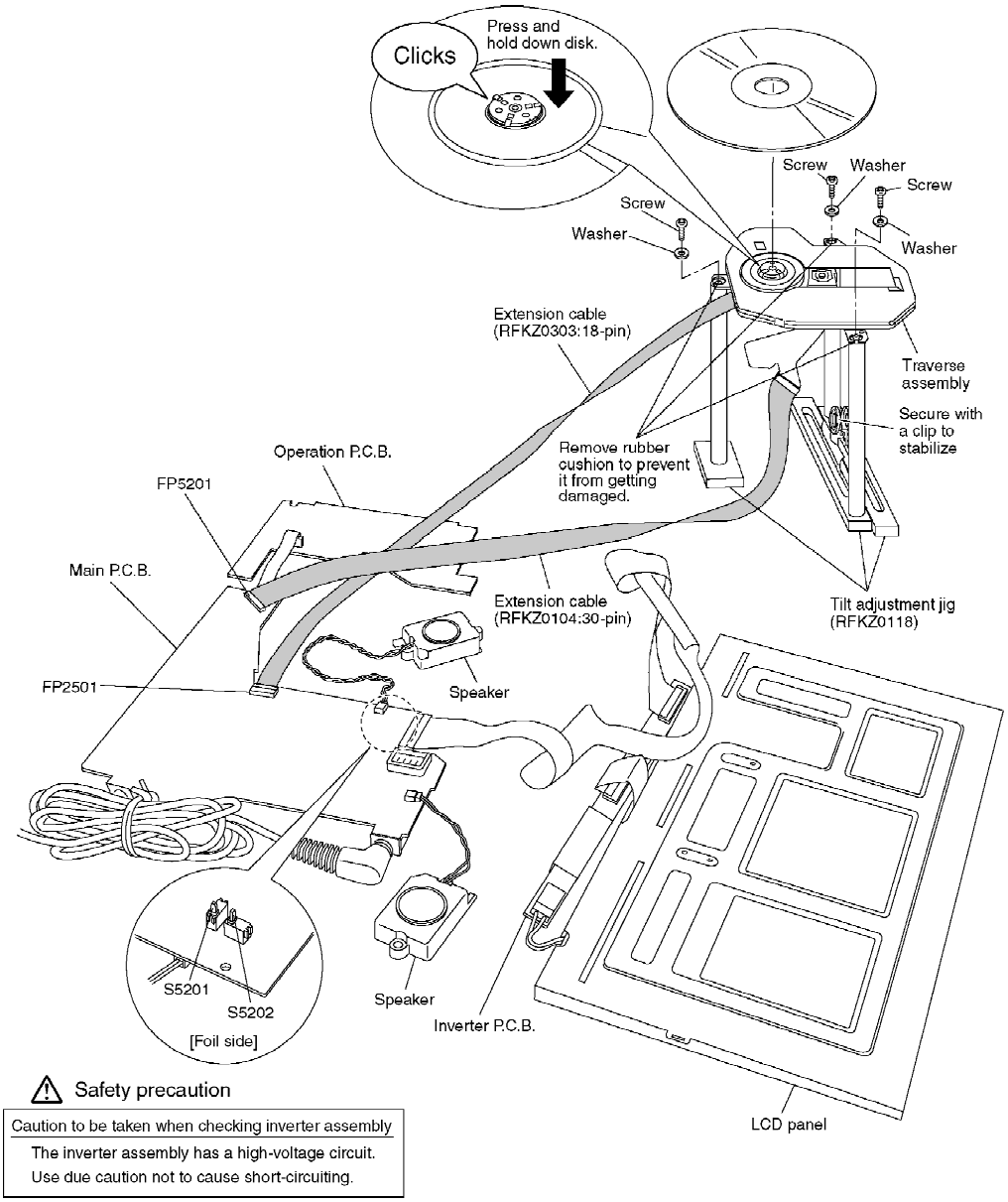
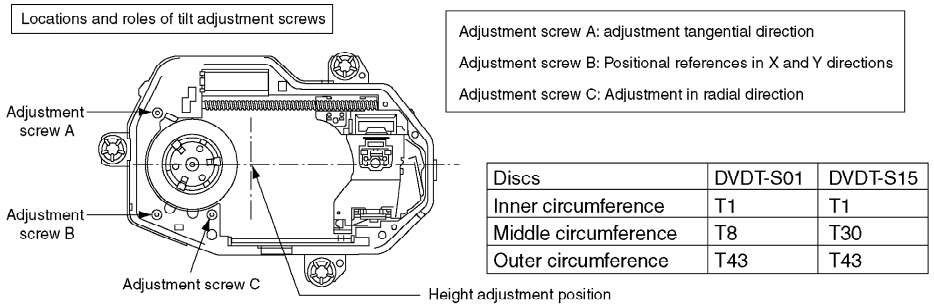


11.4.1.2. Adjustment


Locations and roles of tilt adjustment screws
Adjustment screw A: adjustment tangential direction
Adjustment screw B: Positional references in X and Y directions
Adjustment screw C: Adjustment in radial direction
Adjustment screw A
Adjustment screw B
Adjustment screw C
Height adjustment position

Discs	DVDT-S01	DVDT-S15
Inner circumference	T1	T1
Middle circumference	T8	T30
Outer circumference	T43	T43

1. Play back the disc (DVDT-S01/S15) and make sure the RF signal is outputted.

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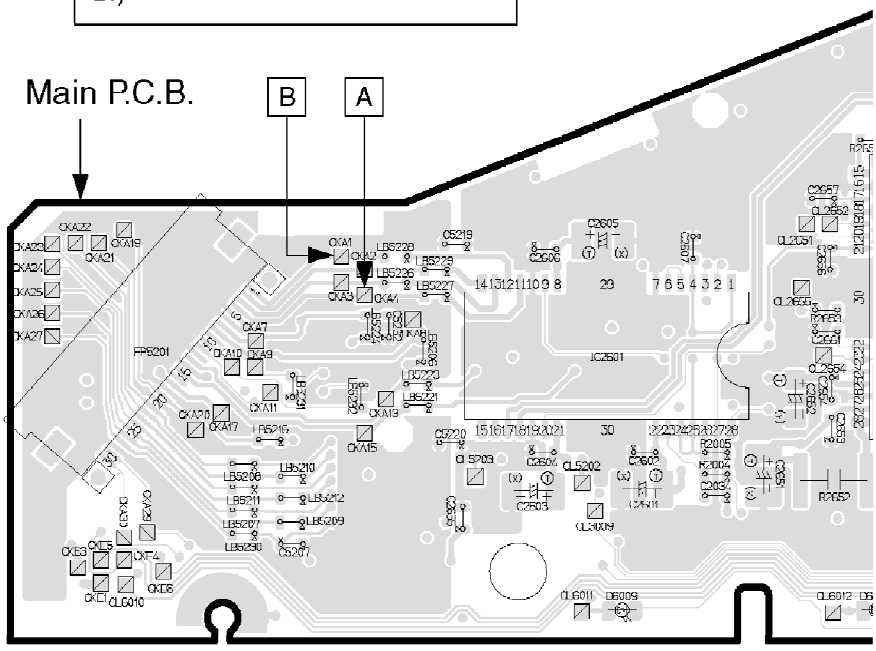
2. **Play back the areas within a radius of 40 ± 1 mm of the disc (middle circumference).**
3. **Turn the adjustment screw C to minimize the jitter value in the radial direction.**
   (*Once turn the screw to the full position and then back off. You should finish tightening in the tightening direction.)
4. **Turn the adjustment screw A to minimize the jitter value in the tangential direction.**
   (*Once turn the screw to the full position and then back off. You should finish tightening in the tightening direction.)
5. **DISC height measurement (Measure the middle of the deflection of the disc and motor surface.)**

The height of the turntable is accepted in case of being less than 1.0V in the DC potential difference on driver IC side of A (CKA4) and B (CKA1). (The voltmeter negative is connected and A and positive are connected B.)



***If the measured height is out of range, adjust to the specified**

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value using the adjustment screws A, B, and C (by the same angle).

11.4.1.3. Checking after adjustment

Play back the test disc and ordinary discs to make sure that there is not any deterioration of image quality or missing of sound at the inner, middle, and outer circumferences.

11.5. Electrical adjustment (LCD)

[How to enter into the LCD panel adjustment mode]
Play back the specified video signal (10 steps, color bas signal).
Press and hold down "Back skip" and "Pause" of the main unit at the same time while pressing "Menu" on the remote control unit.
[The DVD player is now in the FT02 mode]
Press the "Forward skip button twice to enter into the FT04 mode (LCD panel adjustment mode).
Press the "Playback" button to play back the signal which has been played back before stopping and then, press the "Pause (still) button.
[How to exit to normal mode]
(Exit the F4 mode)
1. Turn off the primary power supply (Remove the DC power supply).
Turn on the power supply. Press the "Stop" to stop the system.
Press "Cancel" on the remote control unit (The Cancel key is enabled only when the system is stopped.)

- **Whenever the LCD panel is replaced, make the following checks and adjustments.**
- **Press the "Enter" key and fix the settings.**
- **When the EEPROM" (IC8401) of the Main P.C.B. is replaced, call up the LCD Panel adjustment mode (FT04) and execute the AUDIO on the remove control unit and then check the condition of the screen. Make adjustments as necessary.**

11.5.1. Adjusting VCO oscillation frequency

Adjustment is required when	Check point	
The synchronization of the LCD screen is irregular after any VCO-related circuit part is replaced	TP8201	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “1” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	

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Press “△“ and ” ▽ ”buttons on remote controller, set the right side number to “71”.	-----

11.5.2. Adjusting DC offset of impressed voltage

Adjustment is required when	Check point	
Noise such as horizontal stripes is found on the screen.	TL8401	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “3” on remote control unit.	DVD player/ remote control unit △	DVD player/ remote control ▽
Details of adjustment	Input video signal	
Press “△“and” ▽ ”buttons on remote controller, set the right side number to “AI”.	10step monochrome	

11.5.3. Adjusting white balance red/subcontrast red

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Adjustment is required when	Check point	
Remarkable deviation in white balance is found	TL8602	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “6” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	
(White balance) Press “ “and “ “ buttons on remote controller, set the number of center to “80”. (Sub contrast) Press “ “ and “ “ buttons on remote controller, set the right side number to “7E”.	10step monochrome	

11.5.4. Adjusting whitebalance blue/subcontrast blue

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Adjustment is required when	Check point	
Remarkable deviation in white balance is found	TL8604	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “7” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	
(White balance) Press “ “and “ “ buttons on remote controller, set the number of center to “71”. (Sub contrast) Press “ “and “ “ buttons on remote controller, set the right side number to “84”.	10step monochrome	

11.5.5. Adjusting amplitude of impressed voltage

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Adjustment is required when	Check point	
-----	TL8401	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “2” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	
Press “ “ and “ “ buttons on remote controller, set the right side number to “15”.	10step monochrome	

11.5.6. Adjusting pedestal

Adjustment is required when	Check point	
-----	TL8603	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “4” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	
Press “ “ and “ “ buttons on remote controller, set the number of center to “91”.	10step monochrome	

11.5.7. Adjusting contrast

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Adjustment is required when	Check point	
-----	TL8603	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “4” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	
Press “ “ and “ “ buttons on remote controller, set the right side number to “71”.	10step monochrome	

11.5.8. Adjusting TINT

Adjustment is required when	Check point	
-----	TL8604	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “5” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	
Press “ “ and “ “ buttons on remote controller, set the number of center to “75”.	75% color bar	

11.5.9. Adjusting color

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Adjustment is required when	Check point	
-----	TL8604	
Adjustment procedure	Adjustment UP	Adjustment DOWN
Use “5” on remote control unit.	DVD player/ remote control unit	DVD player/ remote control
Details of adjustment	Input video signal	
Press “ “ and “ “ buttons on remote controller, set the right number to “81”.	75% color bar	

11.6. Electrical check (Video output check)

11.6.1. Checking video output (composite signal)

Check point	Mode	Disc
Video output terminal	Color bar playback (75%)	DVDT-S20D
Measuring apparatus	Check value	
Oscilloscope	Y: 1000 mV ± 100 mV Cyan: 650 mV ± 100 mV	

Purpose: Keep the interchangeability of video signal output

1. **Terminate the composite signal of the video output terminal with 75 Ω and input into the oscilloscope.**
2. **Select color bar 75% from the titles of the DVD test disc and play back.**
3. **Check that the composite signal output is the following value:**

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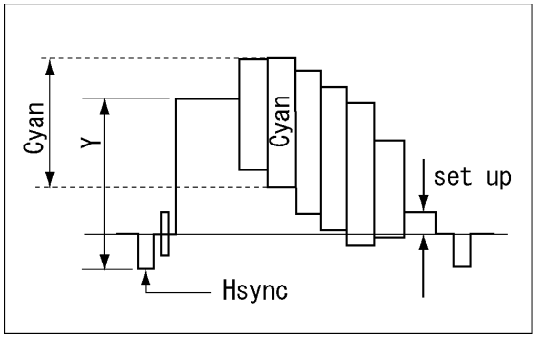
Y＝1000mV±100mV
Cyan＝1000mV±100mV



12. Abbreviations

INITIAL/LOGO		ABBREVIATIONS
A	A0~UP	ADDRESS
	ACLK	AUDIO CLOCK
	AD0~UP	ADDRESS BUS
	ADATA	AUDIO PES PACKET DATA
	ALE	ADDRESS LATCH ENABLE
	AMUTE	AUDIO MUTE
	AREQ	AUDIO PES PACKET REQUEST
	ARF	
	ASI	AUDIO RF
	ASO	SERVO AMP INVERTED INPUT
	ASYNC	SERVO AMP OUTPUT
		AUDIO WORD DISTINCTION SYNC
B	BCK	BIT CLOCK (PCM)
	BCKIN	BIT CLOCK INPUT
	BDO	BLACK DROP OUT
	BLKCK	SUB CODE BLOCK CLOCK
	BOTTOM	CAP. FOR BOTTOM HOLD
	BYP	BYPATH
	BYTCK	BYTE CLOCK

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INITIAL/LOGO		ABBREVIATIONS
C	CAV	CONSTANT ANGULAR VELOCITY
	CBDO	CAP. BLACK DROP OUT
	CD	COMPACT DISC
	CDSCK	CD SERIAL DATA CLOCK
	CDSRDATA	CD SERIAL DATA
	CDRF	CD RF (EFM) SIGNAL
	CDV	COMPACT DISC-VIDEO
	CHNDATA	CHANNEL DATA
	CKSL	SYSTEM CLOCK SELECT
	CLV	CONSTANT LINEAR VELOCITY
	COFTR	CAP. OFF TRACK
	CPA	CPU ADDRESS
	CPCS	CPU CHIP SELECT
	CPDT	CPU DATA
	CPH1~3	CLOCK PULSE SOURCE DRIVE
	CPUADR	CPU ADDRESS LATCH
	CPUADT	CPU ADDRESS DATA BUS
	CPUIRQ	CPU INTERRUPT REQUEST
	CPRD	CPU READ ENABLE
	CPV	GATE DRIVER CLOCK PULSE
	CPWR	CPU WRITE ENABLE
	CS	CHIP SELECT
	CSYNCIN	COMPOSITE SYNC IN
	CSYNCOUT	COMPOSITE SYNC OUT
D	DACCK	D/A CONVERTER CLOCK
	DEEMP	DEEMPHASIS BIT ON/OFF
	DEMPH	DEEMPHASIS SWITCHING
	DIG0~UP	FL DIGIT OUTPUT
	DIN	DATA INPUT
	DMSRCK	DM SERIAL DATA READ CLOCK
	DMUTE	DIGITAL MUTE CONTROL
	DO	DROP OUT
	DOUT0~UP	DATA OUTPUT
	DRF	DATA SLICE RF (BIAS)
	DRPOUT	DROP OUT SIGNAL
	DREQ	DATA REQUEST
	DRESP	DATA RESPONSE
	DSC	DIGITAL SERVO CONTROLLER
	DSLF	DATA SLICE LOOP FILTER
	DVD	DIGITAL VIDEO DISC

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INITIAL/LOGO		ABBREVIATIONS
E	EC	ERROR TORQUE CONTROL
	ECR	ERROR TORQUE CONTROL REFERENCE
	ENCSEL	ENCODER SELECT
	ETMCLK	EXTERNAL M CLOCK (81MHz/ 40.5MHz)
	ETSCLK	EXTERNAL S CLOCK (54MHz)
F	FBAL	FOCUS BALANCE
	FCLK	FRAME CLOCK
	FE	FOCUS ERROR
	FFI	FOCUS ERROR AMP
	FEO	INVERTED INPUT
	FG	FOCUS ERROR AMP OUTPUT
	FSC	FREQUENCY GENERATOR
	FSCK	FREQUENCY SUB CARRIER
		FS (384 OVER SAMPLING) CLOCK
G	GND	COMMON GROUNDING (EARTH)
H	HA0~UP	HOST ADDRESS
	HD0~UP	HOST DATA
	HINT	HOST INTERRUPT
	HRXW	HOST READ/WRITE
I	IECOUT	IEC958 FORMAT DATA
	IPFRAG	OUTPUT
	IREF	INTERPOLATION FLAG
	ISEL	I (CURRENT) REFERENCE
		INTERFACE MODE SELECT
L	LDON	LASER DIODE CONTROL
	LPC	LASER POWER CONTROL
	LRCK	L CH/R CH DISTINCTION CLOCK

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INITIAL/LOGO		ABBREVIATIONS
M	MA0~UP	MEMORY ADDRESS
	MCK	MEMORY CLOCK
	MCKI	MEMORY CLOCK INPUT
	MCLK	MEMORY SERIAL COMMAND CLOCK
	MDATA	MEMORY SERIAL COMMAND DATA
	MDQ0~UP	MEMORY DATA INPUT/OUTPUT
	MDQM	MEMORY DATA I/O MASK
	MLD	MEMORY SERIAL COMMAND LOAD
	MPEG	MOVING PICTURE EXPERTS GROUP
O	ODC	OPTICAL DISC CONTROLLER
	OEH	SOURCE DRIVER OUTPUT ENABLE
	OEV 1, 2	GATE DRIVER OUTPUT ENABLE
	OFTR	OFF TRACKING
	OSCI	OSCILLATOR INPUT
	OSCO	OSCILLATOR OUTPUT
	OSD	ON SCREEN DISPLAY
P	P1~UP	PORT
	PCD	CD TRACKING PHASE DIFFERENCE
	PCK	PLL CLOCK
	PDVD	DVD TRACKING PHASE DIFFERENCE
	PEAK	CAP. FOR PEAK HOLD
	PLLCLK	CHANNEL PLL CLOCK
	PLLOK	PLL LOCK
	PWMCTL	PWM OUTPUT CONTROL
	PWMDA	PULSE WAVE MOTOR DRIVE A
	PWMOA, B	PULSE WAVE MOTOR OUT A, B

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INITIAL/LOGO		ABBREVIATIONS
R	RE	READ ENABLE
	RFENV	RF ENVELOPE
	RFO	RF PHASE DIFFERENCE
	RS	OUTPUT
	RSEL	(CD-ROM) REGISTER SELECT
	RST	RF POLARITY SELECT
	RSV	RESET
		RESERVE

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INITIAL/LOGO		ABBREVIATIONS
S	SBI0, 1	SERIAL DATA INPUT
	SBO0	SERIAL DATA OUTPUT
	SBT0, 1	SERIAL CLOCK
	SCK	SERIAL DATA CLOCK
	SCKR	AUDIO SERIAL CLOCK
	SCL	RECEIVER
	SCLK	SERIAL CLOCK
	SDA	SERIAL CLOCK
	SEG0~UP	SERIAL DATA
	SELCLK	FL SEGMENT OUTPUT
	SEN	SELECT CLOCK
	SIN1, 2	SERIAL PORT ENABLE
	SOUT1, 2	SERIAL DATA IN
	SPDI	SERIAL DATA OUT
	SPDO	SERIAL PORT DATA INPUT
	SPEN	SERIAL PORT DATA OUTPUT
	SPRCLK	SERIAL PORT R/W ENABLE
	SPWCLK	SERIAL PORT READ CLOCK
	SQCK	SERIAL PORT WRITE CLOCK
	SQCX	SUB CODE Q CLOCK
	SRDATA	SUB CODE Q DATA READ
	SRMADR	CLOCK
	SRMDT0~7	SERIAL DATA
		SRAM ADDRESS BUS
	SS	SRAM DATA BUS 0~7
	STAT	START/STOP
	STCLK	STATUS
	STD0~UP	STREAM DATA CLOCK
	STENABLE	STREAM DATA
		STREAM DATA INPUT ENABLE
	STH	SOURCE START PULSE
	STSEL	STREAM DATA POLARITY
	STV	SELECT
	STVALID	GATE DRIVER SCAN START
	SUBC	PULSE
	SBCK	STREAM DATA VALIDITY
	SUBQ	SUB CODE SERIAL
	SYSCLK	SUB CODE CLOCK
		SUB CODE Q DATA
		SYSTEM CLOCK

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INITIAL/LOGO		ABBREVIATIONS
T	TE	TRACKING ERROR
	TIBAL	BALANCE CONTROL
	TID	BALANCE OUTPUT 1
	TIN	BALANCE INPUT
	TIP	BALANCE INPUT
	TIS	BALANCE OUTPUT 2
	TPSN	OP AMP INPUT
	TPSO	OP AMP OUTPUT
	TPSP	OP AMP INVERTED INPUT
	TRCRS	TRACK CROSS SIGNAL
	TRON	TRACKING ON
	TRSON	TRAVERSE SERVO ON

INITIAL/LOGO		ABBREVIATIONS
V	VBLANK	V BLANKING
	VCC	COLLECTOR POWER SUPPLY VOLTAGE
	VCDCONT	VIDEO CD CONTROL (TRACKING BALANCE)
	VDD	DRAIN POWER SUPPLY VOLTAGE
	VFB	VIDEO FEED BACK
	VREF	VOLTAGE REFERENCE
	VSS	SOURCE POWER SUPPLY VOLTAGE
W	WAIT	BUS CYCLE WAIT
	WDCK	WORD CLOCK
	WEH	WRITE ENABLE HIGH
	WSR	WORD SELECT RECEIVER

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INITIAL/LOGO		ABBREVIATIONS
X	X	X' TAL
	XALE	X ADDRESS LATCH ENABLE
	XAREQ	X AUDIO DATA REQUEST
	XCDROM	X CD ROM CHIP SELECT
	XCS	X CHIP SELECT
	XCSYNC	X COMPOSITE SYNC
	XDS	X DATA STROBE
	XHSYNCO	X HORIZONTAL SYNC OUTPUT
	XHINT	XH INTERRUPT REQUEST
	XI	X' TAL OSCILLATOR INPUT
	XINT	X INTERRUPT
	XMW	X MEMORY WRITE ENABLE
	XO	X' TAL OSCILLATOR OUTPUT
	XRE	X READ ENABLE
	XSRMCE	X SRAM CHIP ENABLE
	XSRMOE	X SRAM OUTPUT ENABLE
	XSRMWE	X SRAM WRITE ENABLE
	XVCS	X V-DEC CHIP SELECT
	XVDS	X V-DEC CONTROL BUS
	XVSYNCO	STROBE
		X VERTICAL SYNC OUTPUT

13. VOLTAGE CHART

Note:

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

- Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

13.1. MAIN P.C.B.

13.2. INVERTER P.C.B.

14. BLOCK DIAGRAM

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NOTE
Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

14.1. OVERALL BLOCK DIAGRAM

14.2. POWER SUPPLY BLOCK DIAGRAM

14.3. SERVO BLOCK DIAGRAM

14.4. AUDIO BLOCK DIAGRAM

14.5. VIDEO BLOCK DIAGRAM

15. INTERCONNECTION SCHEMATIC DIAGRAM & SCHEMATIC DIAGRAM NOTES

15.1. INTERCONNECTION SCHEMATIC DIAGRAM

15.2. SCHEMATIC DIAGRAM NOTES

This schematic diagram may be modified at any time with the development of new technology.

Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purpose of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacture's specified parts shown in theparts list.

Important safety notice:
There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the schematic diagrams. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
Cover the parts boxes made of plastics with aluminum foil.
Ground the soldering iron.
Put a conductive mat on the work table.
Do not touch the legs of IC or LSI with the fingers directly.

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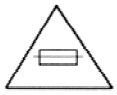
CAUTION : FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE **F1, F3, F4 8A 125V FUSE, F5 1.6A 125V FUSE. F6 4A 125V FUSE.**



RISK OF FIRE-REPLACE FUSE AS MARKED.

FUSE CAUTION

These symbols located near the fuse indicates that the fuse used is a fast operating type. For continued protection against fire harzard, replace with the same type fuse. For fuse rating, refer to the marking adjacent to the symbol.

Ce symbole indique que le fusible utilisé est à rapide. Pour une protection permanente, n' utiliser que des fusibles de même type. Ce dernier est indiqué là qù le présent symbole est apposé.

16. SCHEMATIC DIAGRAM

16.1. CHARGE BATTERY SECTION (MAIN P.C.B. (1/9)) SCHEMATIC DIAGRAM

16.2. POWER SUPPLY SECTION (MAIN P.C.B. (2/9)) SCHEMATIC DIAGRAM

16.3. SERVO SECTION (MAIN P.C.B. (3/9)) SCHEMATIC DIAGRAM

16.4. OPTICAL PICK UP SECTION (MAIN P.C.B. (4/9)) SCHEMATIC DIAGRAM

16.5. DV2 SECTION (MAIN P.C.B. (5/9)) SCHEMATIC DIAGRAM

16.6. VIDEO OUT SECTION (MAIN P.C.B. (6/9)) SCHEMATIC DIAGRAM

16.7. AUDIO OUT SECTION (MAIN P.C.B. (7/9)) SCHEMATIC DIAGRAM

16.8. OPERATION SECTION (MAIN P.C.B. (8/9)) SCHEMATIC DIAGRAM

16.9. LCD IF SECTION (MAIN P.C.B. (9/9)) SCHEMATIC DIAGRAM

16.10. OPERATION SECTION (OPERATION P.C.B.) SCHEMATIC

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DIAGRAM

16.11. INVERTER SECTION SCHEMATIC DIAGARAM

17. CIRCUIT BOARD ASSEMBLY

17.1. MAIN P.C.B. (1/2) (COMPONENT SIDE)

17.2. MAIN P.C.B. (2/2) (FOIL SIDE)

17.3. OPERATION & INVERTER P.C.B.

18. EXPLODED VIEWS

18.1. Casing Parts & Mechanism Section Exploded View

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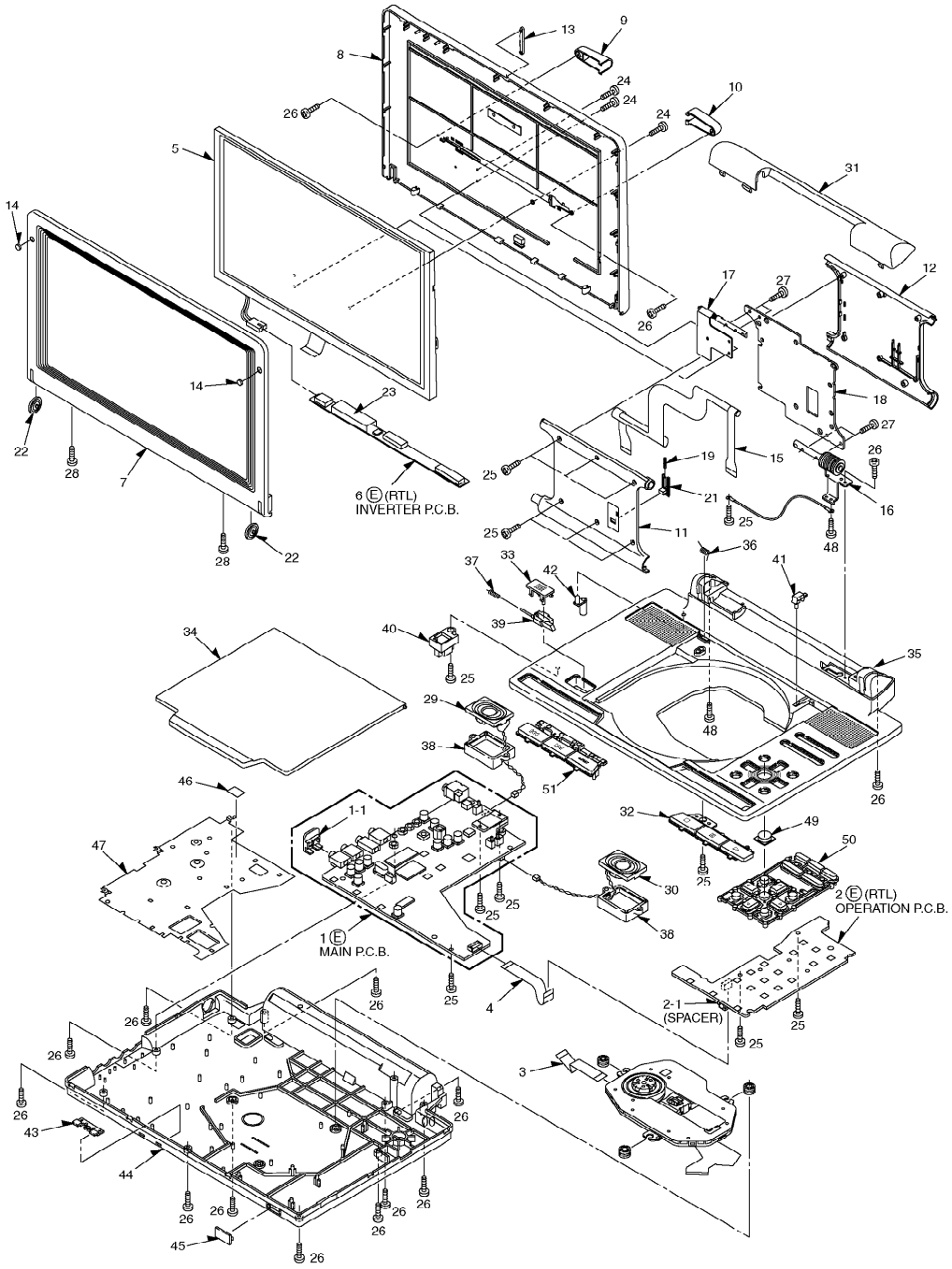

18.2. Mechanism Section Exploded View

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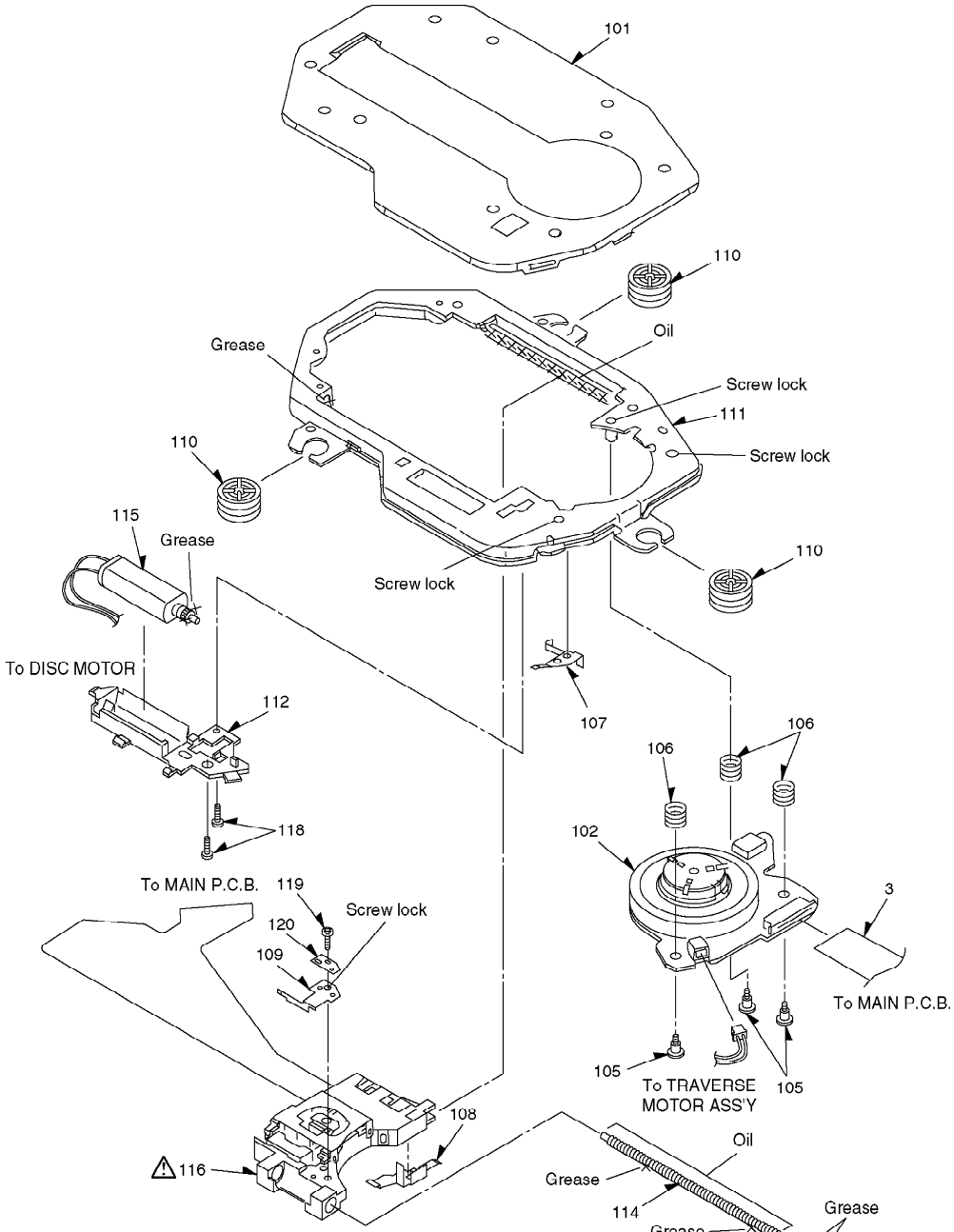

	Part number
Oil	RFKXGUD24
Grease	JGS0101
Screw lock	RZZ0L01

18.3. Packing & Accessories Exploded View

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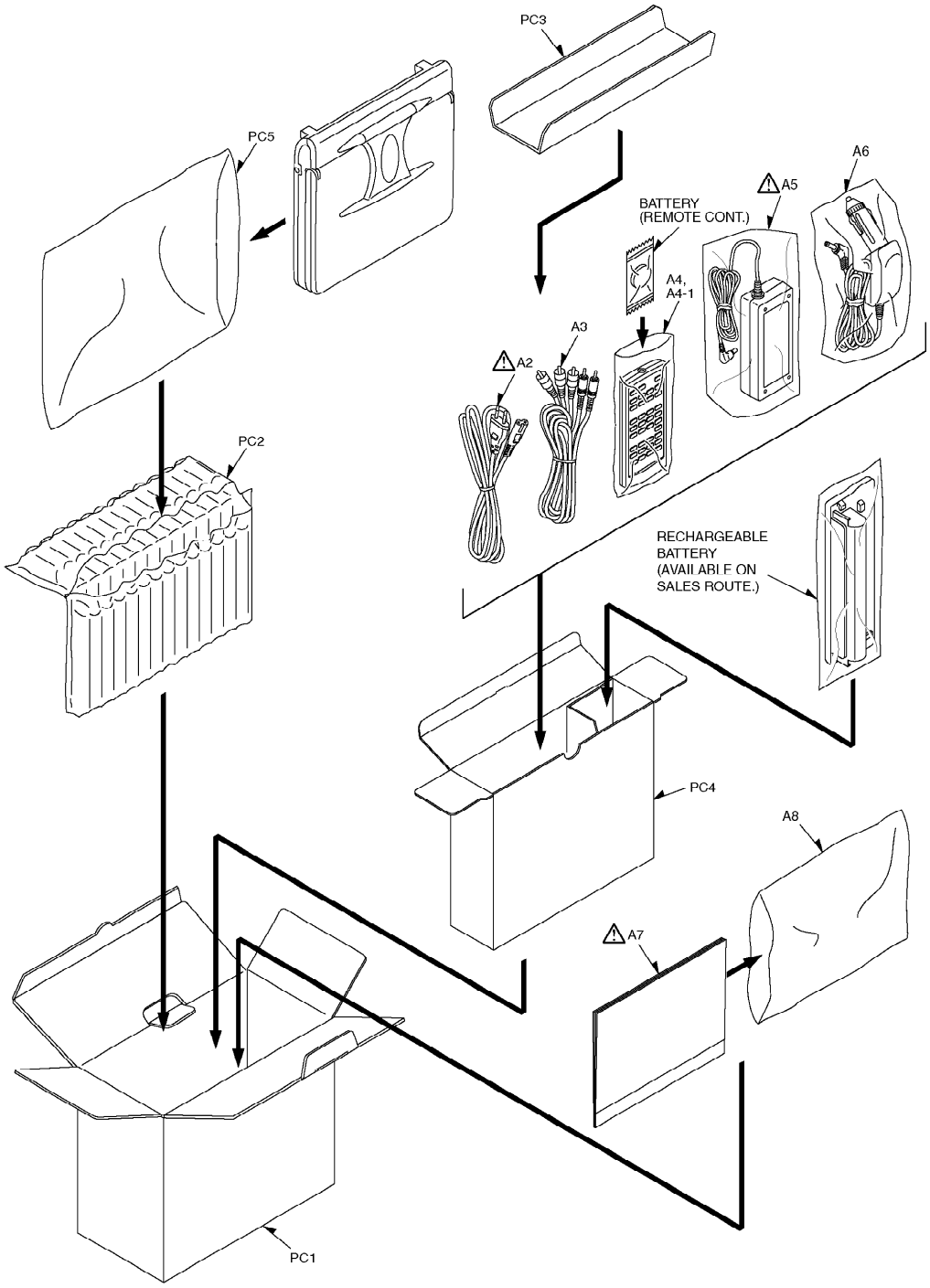

19. REPLACEMENT PARTS LIST

Notes:
***Important safety notice:**
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

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***Warning: This product uses a laser diode. Refer to caution statements.**
***Capacity values are in microfarads (μ F) unless specified otherwise, P=Pico-farads (pF), F= Farads (F).**
***Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).**
***The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.**
***"<IA>,<IB>" marks in Remarks indicate languages of instruction manuals. [<IA>: English, <IB>: Canadian French]**
***All parts are supplied by S.P.C..**

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RFKBLS90MP	MAIN P.C.B.	1	
1-1	RGQ0422-H	HEADPHONE COVER	1	
2	REP3885A-S	OPERATION P.C.B.	1	(RTL)
2-1	RMX0324	REMOTE SENSOR SPACER	1	
3	REZ1697	FFC(18P)	1	
4	REZ1698	FFC(6P)	1	
5	L5EDD2H00005	LCD PANEL	1	
6	REP3894A-S	INVERTER P.C.B.	1	(RTL)
7	RGP1319-K	MONITOR CABINET ASS'Y	1	
8	RGQ0424-S	MONITOR COVER ASS'Y	1	
9	RGQ0425-S	SHAFT HOLDER(L)	1	
10	RGQ0426-S	SHAFT HOLDER(R)	1	
11	RGQ0427-S	MONO ARM	1	
12	RGQ0428-S	MONO ARM COVER	1	
13	RGQ0429-H	MONITOR CUSHION	1	
14	RGQ0431-K	CUSHION	2	
15	RJB3046A	MONO ARM FPC	1	
16	RKC0023	FRICTION HINGE(A)	1	
17	RKC0024	FRICTION HINGE(B)	1	
18	RMA1928	HINGE PLATE	1	
19	RMB0835	LOCK LEVER SPRING	1	
21	RML0700	LOCK LEVER	1	
22	RMR1705-H	ROLLER	2	
23	RMZ0780	INSULATION SHEET	1	
24	XQN17+B4FN	SCREW	3	
25	XQN17+BG4FN	SCREW	14	
26	XQN17+BG6FN	SCREW	15	
27	XQN2+B3FN	SCREW	4	
28	XTN17+6GFJK	SCREW	2	
29	EAS2D01R0	SPEAKER(L)	1	
30	EAS2D01S	SPEAKER(R)	1	
31	RGQ0430-S	HINGE COVER	1	
32	RGU2398-S	OPERATION BUTTON A-R	1	
33	RGU2400-S	OPEN BUTTON	1	
34	RKF0732-S	DISC COVER	1	(LS90PP)
34	RKF0732A-S	DISC COVER	1	(LS93P)
35	RKM0535-S	MAIN CABINET	1	
36	RMB0833	OPEN SPRING	1	
37	RMB0834	OPEN BUTTON SPRING	1	
38	RMG0681-K	SPEAKER RUBBER	2	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
39	RML0699	LOCK LEVER	1	
40	RMQ1450	HEADPHONE JACK COVER	1	
41	RMR1703-H	STOPPER	1	
42	RMR1704-H	LCD OFF BUTTON	1	
43	RGL0679-W	LIGHTING PIECE	1	
44	RKS0413-S	BOTTOM CABINET	1	(LS90PP)
44	RKS0413A-S	BOTTOM CABINET	1	(LS93P)
45	RKW0788-W	REMOTE SENSOR WINDOW	1	
46	RMV0303	NOISE PREVENTION SHEET	1	
47	RMY0354	HEAT SINK	1	
48	XTN17+6GFJK	SCREW	2	
49	RGK1902-Q	ENTER BUTTON	1	
50	RGU2399-S	OPERATION BUTTON	1	
51	RGU2397-S	OPERATION BUTTON A-L	1	
101	RMK0503-C	COVER	1	
102	BKL2E04KA	DISC MOTOR	1	
103	RDG0514-C	INTERFACE GEAR	1	
105	RHD17037	SCREW	3	
106	RMB0681-J	TILT SPRING	3	
107	RMC0448-C	SPRING	1	
108	RMC0592-C	SPRING	1	
109	RMC0455-3C	SPRING	1	
110	RMG0562-K	DAMPER	3	
111	RMK0502-5C	TRAVERSE BASE	1	
112	RMR1393-WC	MOTOR COVER	1	
113	RMS0751-J	INTERFACE GEAR SHAFT	1	
114	RXJ0031	DRIVE SHAFT ASS'Y	1	
115	RXQ0786	TRAVERSE MOTOR ASS'Y	1	
116	RAF3134A-1	OPTICAL PICK-UP	1	⚠
118	XQN17+BG4FN	SCREW	2	
119	RHD17043	SCREW	1	
120	RMC0593-C	SUPPORT PLATE	1	
A2	K2CB2CB00006	AC CORD	1	⚠
A3	K2KA6CB00003	AV CORD	1	
A4	N2QAHC000021	REMOTE CONTROL ASS'Y	1	
A4-1	ETR028272008	BATTERY COVER	1	
A5	RFEA213W-W	AC ADAPTOR	1	⚠
A6	RFEC201M	CAR ADAPTOR	1	
A7	RQT8067-P	OPERATING INSTRUCTIONS	1	<IA> ⚠
A7	RQT8068-C	OPERATING INSTRUCTIONS	1	<IB>(LS90PP) ⚠
A8	RPF0046-1	POLYETHYLENE BAG(F.B.)	1	
C1001,02	ECJ1VB1C105K	16V 1U	2	
C1005	ECJ1VB0J105K	6.3V 1U	1	
C1007	F1H1H101A799	50V 100P	1	
C1015	ECJ1VB0J474K	6.3V 0.47U	1	
C1016	ECJ1VB0J105K	6.3V 1U	1	
C1017	F3F1A106A047	10V 10U	1	
C1018	F1H1H151A799	50V 150P	1	
C1019	F3F1A106A047	10V 10U	1	
C1021	F1H1H151A799	50V 150P	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C1022	ECJ1XC1H271J	50V 270P	1	ECJ1VC1H271J
C1023	ECJ1VB1A224K	10V 0.22U	1	F1H1A224A025
C1025	ECJ1VB1H682K	50V 6800P	1	
C1026	ECJ1XB1H182K	50V 1800P	1	
C1027	F1H1H332A798	50V 3300P	1	
C1051-53	F3G1A476A037	10V 47U	3	
C1063	F1K1C106A062	16V 10U	1	
C1066	ECJ1VB1H103K	50V 0.01U	1	
C1067,68	ECJ1VF1C104Z	16V 0.1U	2	
C1069	ECJ1VB1A105K	10V 1U	1	
C1070	ECJ1VB1H102K	50V 1000P	1	
C1071	F1H1H101A799	50V 100P	1	
C1072	ECJ1XB1H182K	50V 1800P	1	
C1073	ECJ1VB1A224K	10V 0.22U	1	F1H1A224A025
C1074	ECJ1VB1A105K	10V 1U	1	
C1101	ECJ3YB1A106K	10V 10U	1	
C1102	ECJ3YB1E105K	25V 1U	1	
C1103	ECJ1VB1C105K	16V 1U	1	
C1104	ECJ3YB1A106K	10V 10U	1	
C1105,06	F2H1E680A003	25V 68U	2	
C1109	F1J0J1060010	6.3V 10U	1	
C1401	ECJ1VB1H103K	50V 0.01U	1	
C1402	F1H1H101A799	50V 100P	1	
C1403	ECJ3YB1E105K	25V 1U	1	
C1404	F2H1E680A003	25V 68U	1	
C1405	ECJ1VF1C104Z	16V 0.1U	1	
C1406	F1H1H101A799	50V 100P	1	
C1407	F2G1C101A038	16V 100U	1	
C1410	F1H1H101A799	50V 100P	1	
C1411	ECJ3YB1E105K	25V 1U	1	
C1412	F3F1C106A042	16V 10U	1	
C1413	ECJ3YB1E105K	25V 1U	1	
C1414	F3F1A106A047	10V 10U	1	
C1417	F1H1H101A799	50V 100P	1	
C1421,22	ECJ1VF1C104Z	16V 0.1U	2	
C1601	F1H1H101A799	50V 100P	1	
C1606	F1K1C106A062	16V 10U	1	
C1623	F1J0J1060010	6.3V 10U	1	
C1624	ECUV1A335KBN	10V 3.3U	1	F1J1A3350002
C1625	ECJ1VF1C104Z	16V 0.1U	1	
C1651	ECUV1A335KBN	10V 3.3U	1	F1J1A3350002
C1652	F2G1C101A038	16V 100U	1	
C1902	ECJ1VB1C683K	16V 0.068U	1	
C1903	F1L3F2200004	22U	1	
C1904	ECJ1VB1H103K	50V 0.01U	1	
C1905	ECJ1VB1C683K	16V 0.068U	1	
C1906	F1H1H101A799	50V 100P	1	
C1907	ECJ1VB0J684K	6.3V 0.68U	1	
C1908	ECJ1VB1H222K	50V 2200P	1	
C1909	F1H1H332A798	50V 3300P	1	
C1910	ECJ1VB1C105K	16V 1U	1	
C1911	ECJ1VB1H222K	50V 2200P	1	
C1912,13	ECJ1XB1C104K	16V 0.1U	2	
C1914	ECJ1VB1H222K	50V 2200P	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C1915	F1J1C4750003	16V 4.7U	1	
C1917	F1J1C4750003	16V 4.7U	1	
C2001	ECJ1VF1C104Z	16V 0.1U	1	
C2002	ECJ1VB1C333K	16V 0.033U	1	
C2003-05	ECJ1VF1C104Z	16V 0.1U	3	
C2006	ECJ1VB1H562K	50V 5600P	1	
C2007	ECJ1XB1E183K	25V 0.018U	1	
C2008	ECJ1VF1C104Z	16V 0.1U	1	
C2009-12	ECJ1VB0J105K	6.3V 1U	4	
C2013-17	ECJ1XB1C104K	16V 0.1U	5	
C2018-23	ECJ1VF1C104Z	16V 0.1U	6	
C2024,25	ECJ1VF1A105Z	10V 1U	2	
C2026,27	F3F0J476A047	6.3V 47U	2	
C2028	ECJ1VF1C104Z	16V 0.1U	1	
C2030-32	ECJ1VB1H102K	50V 1000P	3	
C2033	ECJ1XC1H821J	50V 820P	1	
C2034	ECJ1XB1C104K	16V 0.1U	1	
C2501	F1H1H101A799	50V 100P	1	
C2601	F3G1A476A037	10V 47U	1	
C2602	ECJ1VF1C104Z	16V 0.1U	1	
C2603	F3G1A476A037	10V 47U	1	
C2604	ECJ1VF1C104Z	16V 0.1U	1	
C2605	F3G1A476A037	10V 47U	1	
C2606,07	ECJ1VF1C104Z	16V 0.1U	2	
C2651	F3G1A476A037	10V 47U	1	
C2652	F3F0J476A047	6.3V 47U	1	
C2653-56	ECJ1VF1C104Z	16V 0.1U	4	
C2657	ECJ1XB1C104K	16V 0.1U	1	
C2658-60	ECJ1VB1H103K	50V 0.01U	3	
C2661	ECJ1VF1C104Z	16V 0.1U	1	
C2662-64	ECJ1VB1H103K	50V 0.01U	3	
C3001	ECJ1VB1H222K	50V 2200P	1	
C3002-05	ECJ1VF1C104Z	16V 0.1U	4	
C3007	ECJ1VF1C104Z	16V 0.1U	1	
C3008	ECJ1VF1A105Z	10V 1U	1	
C3011-13	ECJ1VF1C104Z	16V 0.1U	3	
C3016	ECJ1VF1A105Z	10V 1U	1	
C3017	ECJ1VF1C104Z	16V 0.1U	1	
C3019	ECJ1VF1C104Z	16V 0.1U	1	
C3021	ECJ1VF1C104Z	16V 0.1U	1	
C3023,24	ECJ1VF1A105Z	10V 1U	2	
C3025	ECJ1VF1C104Z	16V 0.1U	1	
C3026,27	F3F0J476A047	6.3V 47U	2	
C3039	ECJ1VC1H270J	50V 27P	1	
C3040	ECJ1VC1H120J	50V 12P	1	
C3051	ECJ1VF1A105Z	10V 1U	1	
C3054,55	ECJ1VF1A105Z	10V 1U	2	
C3056	ECJ1VF1C104Z	16V 0.1U	1	
C3057	ECJ1VB1H222K	50V 2200P	1	
C3061-63	ECJ1VB1H102K	50V 1000P	3	
C3101	ECJ1VB0J105K	6.3V 1U	1	
C3102	ECJ1VF1A105Z	10V 1U	1	
C3103	ECJ1VF1C104Z	16V 0.1U	1	
C3104	ECJ1XC1H101J	50V 100P	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C3107	ECJ1VF1A105Z	10V 1U	1	
C3108	F3F0J476A047	6.3V 47U	1	
C3201	ECJ1VB0J105K	6.3V 1U	1	
C3202	ECJ1VB1H103K	50V 0.01U	1	
C3203	ECJ1VF1C104Z	16V 0.1U	1	
C3204	F2G0G331A012	4V 330U	1	
C3210	F3F0J226A057	6.3V 22U	1	
C3212	ECJ1VB0J105K	6.3V 1U	1	
C3214	ECJ1VB1H102K	50V 1000P	1	
C3215	F3F0J476A047	6.3V 47U	1	
C3221	ECJ1VF1C104Z	16V 0.1U	1	
C3222	F3F0J226A057	6.3V 22U	1	
C3226	ECJ1VB0J105K	6.3V 1U	1	
C3233	ECJ1VB0J105K	6.3V 1U	1	
C3237	F2H0G221A001	25V 220U	1	
C3241-43	ECJ1VB1H102K	50V 1000P	3	
C3251-58	F1H1H470A799	50V 47P	8	
C3261-68	F1H1H470A799	50V 47P	8	
C4001,02	F1J0J1060010	6.3V 10U	2	
C4003,04	ECJ1VC1H390J	50V 39P	2	
C4005,06	F1J0J1060010	6.3V 10U	2	
C4007,08	ECJ1VB1H102K	50V 1000P	2	
C4009,10	ECJ1VB0J474K	6.3V 0.47U	2	
C4011,12	F2G0G331A012	4V 330U	2	
C4013,14	ECJ1VB1H103K	50V 0.01U	2	
C4015	ECJ1VF1C104Z	16V 0.1U	1	
C4017	F2G1C101A038	16V 100U	1	
C4018	F3F0J476A047	6.3V 47U	1	
C4019	ECJ1VF1C104Z	16V 0.1U	1	
C4020	F3F0J476A047	6.3V 47U	1	
C4021	F3F1A226A047	10V 22U	1	
C4023	F3F0J476A047	6.3V 47U	1	
C4024-27	ECJ1VF1C104Z	16V 0.1U	4	
C4028	ECJ1VB1H102K	50V 1000P	1	
C4030	F3F1A226A047	10V 22U	1	
C4031,32	ECJ1VB0J105K	6.3V 1U	2	
C4036	F1J0J1060010	6.3V 10U	1	
C4037,38	ECJ1XB1C104K	16V 0.1U	2	
C4041,42	ECJ1VB1H103K	50V 0.01U	2	
C4053,54	F3F1A106A047	10V 10U	2	
C4057	ECJ1VB0J105K	6.3V 1U	1	
C4061	F3F1A106A047	10V 10U	1	
C4067	F1K1C106A062	16V 10U	1	
C4505	ECJ1VB1H102K	50V 1000P	1	
C4506	ECJ1VF1C104Z	16V 0.1U	1	
C5201	ECJ1VB1H102K	50V 1000P	1	
C5202,03	ECJ1VF1C104Z	16V 0.1U	2	
C5204,05	F1J0J1060010	6.3V 10U	2	
C5206	ECJ1VF1C104Z	16V 0.1U	1	
C5209,10	F1J0J1060010	6.3V 10U	2	
C5211	F3F0J476A047	6.3V 47U	1	
C5215	F3F0J476A047	6.3V 47U	1	
C5217	F1H1H101A799	50V 100P	1	
C5218	ECJ1VF1C104Z	16V 0.1U	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C5219,20	ECJ1VB1H102K	50V 1000P	2	
C5221	F1H1H470A799	50V 47P	1	
C5222	F1J0J1060010	6.3V 10U	1	
C5232	ECJ1VF1C104Z	16V 0.1U	1	
C6002	ECJ1XB1C104K	16V 0.1U	1	
C6003	ECJ1VF1C104Z	16V 0.1U	1	
C6004	ECJ1XB1C104K	16V 0.1U	1	
C6005	F1J0J1060010	6.3V 10U	1	
C6006	ECJ1VF1C104Z	16V 0.1U	1	
C6007,08	ECJ1XB1C104K	16V 0.1U	2	
C6009	ECJ1VB0J105K	6.3V 1U	1	
C6014	F1H1H101A799	50V 100P	1	
C6016,17	ECJ1VF1C104Z	16V 0.1U	2	
C6201	ECJ1VF1C104Z	16V 0.1U	1	
C6202	F1H1H101A799	50V 100P	1	
C6301,02	ECJ1VF1C104Z	16V 0.1U	2	
C6351	ECJ1VF1C104Z	16V 0.1U	1	
C6801	F3F0J476A047	6.3V 47U	1	
C6802	ECJ1VF1C104Z	16V 0.1U	1	
C8001	ECJ1XB1C104K	16V 0.1U	1	
C8003-05	ECJ1XB1C104K	16V 0.1U	3	
C8006	ECJ1VB0J105K	6.3V 1U	1	
C8007	ECJ1VB1E223K	25V 0.022U	1	
C8010,11	ECJ1XB1C104K	16V 0.1U	2	
C8012	F3F1A226A047	10V 22U	1	
C8013-15	ECJ1XB1C104K	16V 0.1U	3	
C8016-18	ECJ1VB0J105K	6.3V 1U	3	
C8020-22	ECUM1A225KBN	10V 2.2U	3	
C8023	ECJ1VB1H103K	50V 0.01U	1	
C8024	ECJ1VB1E223K	25V 0.022U	1	
C8025	F3F1A226A047	10V 22U	1	
C8026	ECJ1VB1E223K	25V 0.022U	1	
C8027	ECJ1VB0J474K	6.3V 0.47U	1	
C8029	F3F1A106A047	10V 10U	1	
C8030	ECUV1A335KBN	10V 3.3U	1	F1J1A3350002
C8031	F1H1H561A799	50V 560P	1	
C8032	ECUM1A225KBN	10V 2.2U	1	
C8040	ECJ1VB1H102K	50V 1000P	1	
C8041	ECJ1VC1H270J	50V 27P	1	
C8042	F1H1H560A799	50V 56P	1	
C8045	ECJ1VB0J105K	6.3V 1U	1	
C8046	ECJ1VF1C104Z	16V 0.1U	1	
C8201	ECJ1VB0J105K	6.3V 1U	1	
C8202-08	F1H1H470A799	50V 47P	7	
C8212	ECJ1VB1H102K	50V 1000P	1	
C8213	ECJ1VB1H103K	50V 0.01U	1	
C8214-16	ECJ1VB1H102K	50V 1000P	3	
C8217	ECJ3YB1E105K	25V 1U	1	
C8218	F3F1A106A047	10V 10U	1	
C8219	ECJ1VB1H102K	50V 1000P	1	
C8220	F3F1A106A047	10V 10U	1	
C8221	ECJ1VB1H102K	50V 1000P	1	
C8222	F1H1H151A799	50V 150P	1	
C8223	ECJ1VB1H102K	50V 1000P	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C8224,25	ECJ1VF1C104Z	16V 0.1U	2	
C8237	ECJ1VB1H102K	50V 1000P	1	
C8250	ECJ1XC1H821J	50V 820P	1	
C8251,52	ECJ1VC1H221J	50V 220P	2	
C8401	ECJ1VF1C104Z	16V 0.1U	1	
C8402	ECJ1VB1A105K	10V 1U	1	
C8403	ECJ1VB1H103K	50V 0.01U	1	
C8404	F3F1C106A042	16V 10U	1	
C8407	ECJ2FB0J475K	6.3V 4.7U	1	F1J0J4750002
C8409,10	ECJ1VB1H102K	50V 1000P	2	
C8601	ECJ1VB1C105K	16V 1U	1	
C8602	ECJ1VB1H102K	50V 1000P	1	
C8604	ECJ1XB1C104K	16V 0.1U	1	
C8605	F1H1H561A799	50V 560P	1	
C8606	ECJ1VB1H102K	50V 1000P	1	
C8607	ECJ1VB0J105K	6.3V 1U	1	
C8801	ECJ1VF1C104Z	16V 0.1U	1	
C8802	ECJ3YB1E105K	25V 1U	1	
C8803	F3F1A226A047	10V 22U	1	
C8804	ECJ1VB1H102K	50V 1000P	1	
C8805	ECJ1VB0J105K	6.3V 1U	1	
C8806	F3F0J476A047	6.3V 47U	1	
C8807	ECJ1VB1H103K	50V 0.01U	1	
C8808	F3F1A226A047	10V 22U	1	
C8809-11	ECJ1VB1C105K	16V 1U	3	
C8812	ECJ1VF1C104Z	16V 0.1U	1	
C8841	F1H1H101A799	50V 100P	1	
D1011	B0JCPD000032	DIODE	1	
D1013	B0JCPD000032	DIODE	1	
D1016	MA8100M	DIODE	1	MAZ81000M
D1017	MA8039MTX	DIODE	1	
D1021	B0JCPD000032	DIODE	1	
D1101	B0JCMD000022	DIODE	1	
D1102,03	MA2S11100L	DIODE	2	
D1401,02	JVCRB051L40T	DIODE	2	B0JCPE000004
D1404	JVCRB051L40T	DIODE	1	B0JCPE000004
D1405	SFPA-73V	DIODE	1	B0JCPD000003
D1411	MA2S11100L	DIODE	1	
D1412	MAZ80510ML	DIODE	1	
D1413,14	MA142WK	DIODE	2	MA3J142E0L
D1415	MAZ80510ML	DIODE	1	
D1416	MA2S11100L	DIODE	1	
D1603	B0JCPD000032	DIODE	1	
D1621	JVCRB051L40T	DIODE	1	B0JCPE000004
D1901,02	MA3S13300L	DIODE	2	
D1903	MA3S132D0L	DIODE	1	
D3001	MA2S11100L	DIODE	1	
D4001	MA3S132D0L	DIODE	1	
D4003	MA3S132D0L	DIODE	1	
D4005	MA2SD2400L	DIODE	1	
D4006	MA2S11100L	DIODE	1	
D4009	MA2S11100L	DIODE	1	
D5221	MA2S11100L	DIODE	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
D6007	MA142WK	DIODE	1	MA3J142E0L
D6008	B3ACB0000108	DIODE	1	
D6009	B3AAB0000151	DIODE	1	
D6801	MAZ80560ML	DIODE	1	
D8001	MA2Z07700L	DIODE	1	
D8201	MA3J745D0L	DIODE	1	
D8202	MA2Z07700L	DIODE	1	
D8601	MA2X33800L	DIODE	1	
FL8201-03	J0HAAB000037	FILTER	3	
FP1901	K1MN40BA0059	CONNECTOR(40P)	1	
FP1903	K1MN30BA0059	CONNECTOR(30P)	1	
FP2501	K1MN18B00048	CONNECTOR(18P)	1	
FP3031	K1MN10A00068	CONNECTOR(10P)	1	
FP5201	K1MN30BA0079	CONNECTOR(30P)	1	
FP6001	K1MN06B00131	CONNECTOR(6P)	1	
FP6801	K1MN06A00048	CONNECTOR(6P)	1	
FP8003,04	K1KA02BA0014	CONNECTOR(2P)	2	
FP8005	K1MN40BA0059	CONNECTOR(40P)	1	
IC1001	C1ZBZ0002345	IC	1	
IC1003	C0DBZHD00013	IC	1	
IC1004	C0CBCDC00008	IC	1	
IC1101	C0CBCDC00008	IC	1	
IC1401	C0DBCMD00005	IC	1	
IC1411	C0DBFHZ00003	IC	1	
IC1601	C0DBDZZ00006	IC	1	
IC1901	C0DBZKA00003	IC	1	
IC2601	C0GBG0000048	IC	1	
IC2651	C0GBF0000004	IC	1	
IC3001	MN2DS03VP1H	IC	1	
IC3051	C3ABPG000133	IC	1	
IC3201	C9ZB00000461	IC	1	
IC4001	C0FBBK000049	IC	1	
IC4002	NJM2115V	IC	1	C0ABBB000104
IC4003	C0ZBZ0001010	IC	1	
IC4009	C0CBCDC00008	IC	1	
IC5201	C0JBAS000265	IC	1	
IC6001	MN101C87AAD	IC	1	
IC6002	C0JBAA000344	IC	1	
IC6006	C0JBAA000175	IC	1	
IC6201	C0EBE0000384	IC	1	
IC6301	RFKWPS81Z160	IC	1	
IC8001	AN2546FH-AV	IC	1	
IC8201	MN5814	IC	1	
IC8202	C0JBAZ002192	IC	1	
IC8401	C3EBDC000063	IC	1	
IC8403	C0ABBB000271	IC	1	
IC8602	NJM2904V	IC	1	C0ABBA000084
IC8801	AN78L05M-E1	IC	1	AN78L05ME1
IC8802	C0CBABC00147	IC	1	
IP1401	K5H3121A0004	IC PROTECTOR	1	⚠

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
IP1421	K5H3121A0004	IC PROTECTOR	1	⚠
IP1901	K5H2021A0003	IC PROTECTOR	1	⚠
IR6801	B3RAD0000075	IC	1	
JK1401	K2ED2B000002	JACK,DC IN	1	
JK1421	K4ZZ04000033	BATTERY TERMINAL	1	
JK3201	K2HC104B0027	JACK,VIDEO	1	
JK4001	K2HC108B0002	JACK,AUDIO/OPT OUT	1	
JK4002,03	VJJ0686	JACK,HEADPHONE	2	K2HC105B0009
L1002	VLQ0914M150T	COIL 15UH	1	G1C150M00009
L1006,07	VLQ0914M150T	COIL 15UH	2	G1C150M00009
L1009	VLQ0914M150T	COIL 15UH	1	G1C150M00009
L1101-03	G1C100KA0055	COIL 10UH	3	
L1401	VLQ0849	COIL	1	G0B200H00005
L1402	G1C220M00043	COIL 22UH	1	
L1901	G1C150Z00004	COIL 15UH	1	
L2001,02	G1C100KA0055	COIL 10UH	2	
L3003	VLP0323A601R	COIL	1	J0JCC0000062
L3101	VLP0323A601R	COIL	1	J0JCC0000062
L3204	G1C220KA0055	COIL 22UH	1	
L3251-54	G1C220KA0055	COIL 22UH	4	
L3261-64	G1C220KA0055	COIL 22UH	4	
L4001	J0JBC0000028	COIL	1	
L4002	G1C220KA0055	COIL 22UH	1	
L4004	VLP0323A601R	COIL	1	J0JCC0000062
L4006	J0JBC0000028	COIL	1	
L5201	G1C100KA0055	COIL 10UH	1	
L8030	G1C120JA0041	COIL 12UH	1	
L8602	G1C1R5JA0041	COIL 1.5UH	1	
L8805	ERJ3GEY0R00	1/10W 0	1	
L8806	VLQ0914M150T	COIL 15UH	1	G1C150M00009
LB3001,02	J0JHC0000045	COIL	2	
LB3006	J0JBC0000028	COIL	1	
LB3007	VLP0323A601R	COIL	1	J0JCC0000062
LB3203	VLP0323A601R	COIL	1	J0JCC0000062
LB4001,02	VLQ0865M220T	COIL	2	G1C220M00012
LB4003-07	J0JBC0000028	COIL	5	
LB4010,11	J0JBC0000028	COIL	2	
LB4013,14	J0JBC0000028	COIL	2	
LB4051	J0JBC0000028	COIL	1	
LB5206	J0JBC0000028	COIL	1	
LB5207-13	VLP0323A601R	COIL	7	J0JCC0000062
LB5216	VLP0323A601R	COIL	1	J0JCC0000062
LB5218	ERJ3GEY0R00	1/10W 0	1	
LB5219	VLP0323A601R	COIL	1	J0JCC0000062
LB5221-24	VLP0323A601R	COIL	4	J0JCC0000062
LB5226-29	VLP0323A601R	COIL	4	J0JCC0000062
LB5230	J0JHC0000045	COIL	1	
LB5231,32	VLP0323A601R	COIL	2	J0JCC0000062
LB8001	VLP0323A601R	COIL	1	J0JCC0000062

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
LB8201	J0JHC0000045	COIL	1	
LB8205	J0JHC0000045	COIL	1	
LB8603	J0JHC0000045	COIL	1	
LB8801-07	ERJ3GEY0R00	1/10W 0	7	
LB8808-11	J0JHC0000045	COIL	4	
P1902	K1KA02B00123	CONNECTOR(2P)	1	
PC1	RPK2302	PACKING CASE	1	(LS90PP)
PC1	RPK2306	PACKING CASE	1	(LS93P)
PC2	RPQ1954	QOO PACK	1	
PC3	RPQ1955	PAD	1	
PC4	RPQF0277	ACCESSORY BOX	1	
PC5	RPFC0031-B	POLYETHYLENE BAG(UNIT)	1	
Q1001-03	B1DHCD000023	TRANSISTOR	3	
Q1101	B1BBCF000026	TRANSISTOR	1	
Q1402	XP132A1545SR	IC	1	B1DHFD000008
Q1412	2SB1218ARL	TRANSISTOR	1	
Q1621	B1BBCF000031	TRANSISTOR	1	
Q1622	B1CFHA000002	TRANSISTOR	1	
Q1901	B1DFDF000001	TRANSISTOR	1	
Q4001,02	2SD1819AWL	TRANSISTOR	2	
Q5201,02	2SD1819AWL	TRANSISTOR	2	
Q5211	B1ADPC000004	TRANSISTOR	1	
Q5215	B1ADPC000004	TRANSISTOR	1	
Q8001	2SB1218ARL	TRANSISTOR	1	
Q8002	XP4501TX	TRANSISTOR	1	XP0450100L
Q8201	XP4501TX	TRANSISTOR	1	XP0450100L
Q8401	XN4601TX	TRANSISTOR	1	XN0460100L
Q8406	XN4601TX	TRANSISTOR	1	XN0460100L
QR1007,08	UN5213TX	TRANSISTOR	2	UNR521300L
QR1402	UN5213TX	TRANSISTOR	1	UNR521300L
QR1411	B1ZBZ0000049	TRANSISTOR	1	
QR1413	B1GDCFJN0011	TRANSISTOR	1	
QR1601	XP0121300L	TRANSISTOR	1	
QR4001	UN5213TX	TRANSISTOR	1	UNR521300L
QR4002,03	B1GDCFJN0011	TRANSISTOR	2	
QR4004,05	XP0121300L	TRANSISTOR	2	
QR4006,07	B1GDCFJN0011	TRANSISTOR	2	
QR4008	UN5213TX	TRANSISTOR	1	UNR521300L
QR4009	XP0121300L	TRANSISTOR	1	
QR4011-13	B1GFGCAA0001	TRANSISTOR	3	
QR5221	UNR212100L	TRANSISTOR	1	
R1005	ERJ3RBD103	1/16W 10K	1	
R1006	ERJ3RBD563V	1/16W 56K	1	
R1014	ERJ3RBD103	1/16W 10K	1	
R1015	ERJ3GEYJ333	1/10W 33K	1	
R1016	ERJ3GEYJ183V	1/10W 18K	1	D0GB183JA002
R1018	ERJ3GEYJ822	1/10W 8.2K	1	
R1019	ERJ3GEYJ472	1/10W 4.7K	1	
R1020	ERJ3GEYJ272	1/10W 2.7K	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R1022	ERJ3RBD123	1/16W 12K	1	
R1023	ERJ3GEYJ333	1/10W 33K	1	
R1027,28	ERA3YED332	1/16W 3.3K	2	
R1029	ERJ3RBD333	1/16W 33K	1	
R1030	ERJ3GEYJ183V	1/10W 18K	1	D0GB183JA002
R1032	ERJ3RBD183	1/16W 18K	1	
R1033	ERJ3RBD102	1/16W 1K	1	
R1034	ERJ3RBD822	1/10W 8.2K	1	
R1035	ERJ3GEYJ331	1/10W 330	1	
R1037	ERJ3RBD393	1/16W 39K	1	
R1038	ERJ3RBD102	1/16W 1K	1	
R1039	ERJ3RBD822	1/10W 8.2K	1	
R1040	ERJ3RBD122	1/16W 1.2K	1	
R1044,45	ERJ3GEYJ102V	1/10W 1K	2	
R1060	ERJ3GEYJ151V	1/10W 150	1	
R1061	ERJ3GEYJ822	1/10W 8.2K	1	
R1063	ERJ3RBD123	1/16W 12K	1	
R1064	ERJ3RBD333	1/16W 33K	1	
R1102	ERJ3RBD683	1/16W 68K	1	
R1103	ERJ3RBD102	1/16W 1K	1	
R1104	ERJ3RBD103	1/16W 10K	1	
R1105	ERJ3GEYJ561	1/10W 560	1	
R1106,07	ERJ3GEYJ220	1/10W 22	2	
R1401	ERJ3GEYJ223	1/10W 22K	1	
R1406	ERJ3RBD223	1/16W 22K	1	
R1407	ERA3YED332	1/16W 3.3K	1	
R1410,11	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R1412	ERJ3GEYJ104	1/10W 100K	1	
R1413	ERJ3GEYJ223	1/10W 22K	1	
R1414,15	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R1416	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R1418	ERJ3GEYJ105V	1/10W 1M	1	
R1621	D1BFR470A007	1/2W 0.47	1	
R1622	ERJ3RBD103	1/16W 10K	1	
R1623-25	ERJ3RBD104	1/16W 100K	3	
R1626	ERJ3RBD103	1/16W 10K	1	
R1627	ERJ3RBD104	1/16W 100K	1	
R1628	ERJ3RBD223	1/16W 22K	1	
R1629	ERJ3RBD104	1/16W 100K	1	
R1630	ERJ3GEYJ123V	1/10W 12K	1	
R1632	ERJ3RBD103	1/16W 10K	1	
R1633	ERJ3GEYJ102V	1/10W 1K	1	
R1635	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R1638	ERJ3GEYJ102V	1/10W 1K	1	
R1643	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R1901	ERJ3RBD563V	1/16W 56K	1	
R1902	ERJ3RBD623	1/16W 6.2K	1	
R1903,04	ERJ3GEYJ104	1/10W 100K	2	
R1905	ERJ3GEYJ102V	1/10W 1K	1	
R1907	ERJ3GEYJ334	1/10W 330K	1	D0GB334JA002
R1908	ERJ3GEYJ224	1/10W 220K	1	
R1909	ERJ3GEYJ123V	1/10W 12K	1	
R1910	ERJ3RBD471	1/16W 470	1	
R1911	ERJ3GEYJ393	1/10W 39K	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R1912	ERJ3GEYJ221	1/10W 220	1	
R1913,14	ERJ3GEY0R00	1/10W 0	2	
R1915	ERJ3GEYJ220	1/10W 22	1	
R1916	ERJ3GEYJ392	1/10W 3.9K	1	
R1917	ERJ3GEYJ563	1/10W 56K	1	
R1919	ERJ3RED274	1/16W 270K	1	
R2002,03	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R2004	ERJ3GEYJ333	1/10W 33K	1	
R2005	ERJ3GEYJ182V	1/10W 1.8K	1	
R2006	ERJ3GEY0R00	1/10W 0	1	
R2501	ERJ3GEYJ471	1/10W 470	1	
R2523	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R2651	ERJ3GEYJ471	1/10W 470	1	
R2652	ERJ12RQJR68U	1/2W 68	1	
R2653	ERJ3GEYD153V	1/10W 15K	1	D0HB153ZA002
R3001	ERJ3GEYJ680	1/10W 68	1	ERJ3GEYJ680V
R3002	ERJ3GEYJ220	1/10W 22	1	
R3003	ERJ3GEYJ330	1/10W 33	1	
R3004	ERJ3GEYJ331	1/10W 330	1	
R3005-07	ERJ3GEYJ471	1/10W 470	3	
R3008	ERJ3GEYJ220	1/10W 22	1	
R3010	ERJ3GEY0R00	1/10W 0	1	
R3011	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R3012	ERJ3GEYJ221	1/10W 220	1	
R3013	ERJ3GEYJ105V	1/10W 1M	1	
R3014	ERJ3GEYJ271	1/10W 270	1	
R3015	ERJ3GEY0R00	1/10W 0	1	
R3101	ERJ3RBD333	1/16W 33K	1	
R3102	ERJ3RBD152	1/16W 1.5K	1	
R3103	ERJ3RBD222	1/16W 2.2K	1	
R3104	ERJ3RBD151V	1/16W 150	1	
R3105	ERJ3GEYJ4R7	1/10W 4.7	1	D0GB4R7JA002
R3106	ERJ3RBD151V	1/16W 150	1	
R3107	ERJ3GEYJ120V	1/10W 12	1	
R3108	ERJ3RBD151V	1/16W 150	1	
R3109	ERJ3GEYJ180V	1/10W 18	1	
R3110,11	ERJ3RED820V	1/16W 82	2	
R3203	ERJ3RED750V	1/16W 75	1	
R3205	ERJ3GEYJ102V	1/10W 1K	1	
R3232,33	ERJ3GEYJ223	1/10W 22K	2	
R3251	ERJ3GEYJ681	1/10W 680	1	
R3261	ERJ3GEYJ681	1/10W 680	1	
R4001,02	ERJ3GEYJ273	1/10W 27K	2	
R4003,04	ERJ3GEYJ333	1/10W 33K	2	
R4005,06	ERJ3GEYJ100	1/10W 10	2	
R4007	ERJ3GEYJ104	1/10W 100K	1	
R4008	ERJ3GEYJ102V	1/10W 1K	1	
R4009,10	ERJ3GEYJ473V	1/10W 47K	2	D0GB473JA002
R4011,12	ERJ3GEYJ101	1/10W 100	2	D0GB101JA002
R4013,14	ERJ3GEYJ332	1/10W 3.3K	2	
R4015,16	ERJ3GEYJ563	1/10W 56K	2	
R4017,18	ERJ3GEYD153V	1/10W 15K	2	D0HB153ZA002
R4019,20	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R4021,22	ERJ8GEYJ1R5	1/8W 1.5	2	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R4023,24	ERJ3GEYJ152V	1/10W 1.5K	2	
R4025,26	ERJ3GEYJ472	1/10W 4.7K	2	
R4027,28	ERJ3GEYJ223	1/10W 22K	2	
R4030	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R4031	ERJ3GEYJ222	1/10W 2.2K	1	
R4032	ERJ3GEYJ102V	1/10W 1K	1	
R4033,34	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R4035,36	ERJ3GEYJ562	1/10W 5.6K	2	
R4037,38	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R4039	ERJ3GEYJ104	1/10W 100K	1	
R4040	ERJ3GEY0R00	1/10W 0	1	
R4041,42	ERJ3GEYJ821	1/10W 820	2	
R4043	ERJ3GEYJ333	1/10W 33K	1	
R4044	ERJ3GEYJ223	1/10W 22K	1	
R4045	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R4046	ERJ3GEYJ223	1/10W 22K	1	
R4047	ERJ3GEYJ333	1/10W 33K	1	
R4063,64	ERJ8GEYJ1R5	1/8W 1.5	2	
R4065,66	ERJ3GEYJ152V	1/10W 1.5K	2	
R4067,68	ERJ3GEYJ472	1/10W 4.7K	2	
R4069	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R5201	ERJ3GEYJ223	1/10W 22K	1	
R5203	ERJ3GEYJ333	1/10W 33K	1	
R5204,05	ERJ3GEYJ102V	1/10W 1K	2	
R5208,09	ERJ3GEYJ331	1/10W 330	2	
R5210	ERJ3GEYJ100	1/10W 10	1	
R5211	ERJ3GEYJ2R2	1/10W 2.2	1	
R5212	ERJ12YJ270	1/2W 27	1	
R5213	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R5214	ERJ3GEYD153V	1/10W 15K	1	D0HB153ZA002
R5215	ERJ3GEYJ2R2	1/10W 2.2	1	
R5216	ERJ12YJ270	1/2W 27	1	
R5217	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R5218	ERJ3GEYJ100	1/10W 10	1	
R5219,20	ERJ3RED910	1/16W 91	2	
R5221	ERJ3GEYJ102V	1/10W 1K	1	
R5224,25	ERJ3GEY0R00	1/10W 0	2	
R6001	ERJ3RBD123	1/16W 12K	1	
R6006	ERJ3GEYJ821	1/10W 820	1	
R6007	ERJ3GEYJ102V	1/10W 1K	1	
R6008	ERJ3GEYJ122	1/10W 1.2K	1	
R6009	ERJ3RBD333	1/16W 33K	1	
R6012	ERJ3RBD333	1/16W 33K	1	
R6013	ERJ3GEY0R00	1/10W 0	1	
R6015	ERJ3GEYJ561	1/10W 560	1	
R6016-18	ERJ3GEY0R00	1/10W 0	3	
R6023	ERJ3RBD103	1/16W 10K	1	
R6025	ERJ3GEYJ273	1/10W 27K	1	
R6026	ERJ3GEYJ104	1/10W 100K	1	
R6027	ERJ3GEYJ221	1/10W 220	1	
R6041	ERJ3GEYJ331	1/10W 330	1	
R6201	ERJ3GEYJ102V	1/10W 1K	1	
R6351	ERJ3GEYJ331	1/10W 330	1	
R6801	ERJ3GEYJ122	1/10W 1.2K	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R6802	ERJ3GEYJ152V	1/10W 1.5K	1	
R6803	ERJ3GEYJ182V	1/10W 1.8K	1	
R6804	ERJ3GEYJ222	1/10W 2.2K	1	
R6805	ERJ3GEYJ332	1/10W 3.3K	1	
R6806	ERJ3GEYJ472	1/10W 4.7K	1	
R6807	ERJ3GEYJ682	1/10W 6.8K	1	
R6808	ERJ3GEYJ123V	1/10W 12K	1	
R6809	ERJ3GEYJ223	1/10W 22K	1	
R6813	ERJ3GEYJ152V	1/10W 1.5K	1	
R6814	ERJ3GEYJ182V	1/10W 1.8K	1	
R6815	ERJ3GEYJ222	1/10W 2.2K	1	
R6816	ERJ3GEYJ332	1/10W 3.3K	1	
R6817	ERJ3GEYJ472	1/10W 4.7K	1	
R6818	ERJ3GEYJ821	1/10W 820	1	
R6819	ERJ3GEYJ102V	1/10W 1K	1	
R6820	ERJ3GEYJ220	1/10W 22	1	
R8002	ERJ3GEYJ472	1/10W 4.7K	1	
R8006-08	ERJ3GEYJ101	1/10W 100	3	D0GB101JA002
R8009	ERJ3GEYJ105V	1/10W 1M	1	
R8010	ERJ3GEYJ332	1/10W 3.3K	1	
R8011-13	ERJ3GEYJ103V	1/10W 10K	3	D0GB103JA002
R8014	ERJ3GEYJ562	1/10W 5.6K	1	
R8015	ERJ3GEYJ392	1/10W 3.9K	1	
R8039,40	ERJ3GEYJ102V	1/10W 1K	2	
R8042	ERJ3GEYJ102V	1/10W 1K	1	
R8045	ERJ3GEYJ561	1/10W 560	1	
R8046	ERJ3GEYJ333	1/10W 33K	1	
R8047	ERJ3GEYJ273	1/10W 27K	1	
R8048	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R8049	ERJ3GEYJ102V	1/10W 1K	1	
R8203	ERJ3GEYJ472	1/10W 4.7K	1	
R8205	ERJ3GEYJ102V	1/10W 1K	1	
R8209,10	ERJ3GEYJ102V	1/10W 1K	2	
R8212-14	ERJ3GEYJ102V	1/10W 1K	3	
R8218	ERJ3GEYJ102V	1/10W 1K	1	
R8219	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R8221	ERJ3GEYJ151V	1/10W 150	1	
R8222	ERJ3GEYJ101	1/10W 100	1	D0GB101JA002
R8223	ERJ3GEYJ820	1/10W 82	1	
R8225	ERJ3GEYJ332	1/10W 3.3K	1	
R8226	ERJ3GEYJ222	1/10W 2.2K	1	
R8227	ERJ3GEYJ273	1/10W 27K	1	
R8232,33	ERJ3GEY0R00	1/10W 0	2	
R8236-38	ERJ3GEY0R00	1/10W 0	3	
R8241	ERJ3GEY0R00	1/10W 0	1	
R8243	ERJ3GEY0R00	1/10W 0	1	
R8245	ERJ3GEY0R00	1/10W 0	1	
R8250,51	ERJ3GEYJ393	1/10W 39K	2	
R8252	ERJ3GEYJ823	1/10W 82K	1	
R8253	ERJ3GEY0R00	1/10W 0	1	
R8255	ERJ3GEYJ823	1/10W 82K	1	
R8256	ERJ3GEYJ332	1/10W 3.3K	1	
R8257	ERJ3GEYJ152V	1/10W 1.5K	1	
R8258	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R8401	ERJ3GEYJ223	1/10W 22K	1	
R8402	ERJ3GEYJ184V	1/10W 180K	1	
R8403	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R8404	ERJ3GEYD153V	1/10W 15K	1	D0HB153ZA002
R8405,06	ERJ3GEYJ563	1/10W 56K	2	
R8407	ERJ3GEYJ223	1/10W 22K	1	
R8408	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R8409	ERJ3GEYJ183V	1/10W 18K	1	D0GB183JA002
R8410	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R8411	ERJ3GEYJ472	1/10W 4.7K	1	
R8413	ERJ3GEYJ333	1/10W 33K	1	
R8425	ERJ3GEYJ470	1/10W 47	1	
R8428,29	ERJ3GEYJ123V	1/10W 12K	2	
R8430	ERJ3GEYJ470	1/10W 47	1	
R8433	ERJ3GEY0R00	1/10W 0	1	
R8605	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R8606	ERJ3GEYJ105V	1/10W 1M	1	
R8607	ERJ3GEYJ683	1/10W 68K	1	
R8608	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R8609	ERJ3GEYJ473V	1/10W 47K	1	D0GB473JA002
R8610	ERJ3GEYJ683	1/10W 68K	1	
R8611	ERJ3GEYJ223	1/10W 22K	1	
R8612	ERJ3GEYJ103V	1/10W 10K	1	D0GB103JA002
R8613	ERJ3GEYJ563	1/10W 56K	1	
R8614,15	ERJ3GEYJ103V	1/10W 10K	2	D0GB103JA002
R8616	ERJ3GEYJ474	1/10W 470K	1	
R8801	ERJ3GEYJ223	1/10W 22K	1	
R8802	ERJ3GEYJ333	1/10W 33K	1	
R8803	ERJ3GEYJ223	1/10W 22K	1	
R8804	ERJ3GEYJ333	1/10W 33K	1	
R8805	ERJ3GEY0R00	1/10W 0	1	
RX2651	EXB28V103JX	RESISTOR-RESISTOR	1	
RX3001	EXB28V103JX	RESISTOR-RESISTOR	1	
RX3003	D1H84724A024	RESISTOR-RESISTOR	1	
RX3007	EXB28V103JX	RESISTOR-RESISTOR	1	
RX6001,02	EXB28V103JX	RESISTOR-RESISTOR	2	
RX6351	D1H84724A024	RESISTOR-RESISTOR	1	
S5201	ESE11MV9T	SWITCH	1	
S5202	ESE11MV9T	SWITCH	1	
S6003	ESE11MV9T	SWITCH	1	
S6018	K0H1BA000432	SWITCH	1	
S6019	K0H1BA000432	SWITCH	1	
S6020	K0H1BA000432	SWITCH	1	
S6802	K0H1BA000432	SWITCH	1	
S6803	K0H1BA000432	SWITCH	1	
S6804	K0H1BA000432	SWITCH	1	
S6805	K0H1BA000432	SWITCH	1	
S6806	K0H1BA000432	SWITCH	1	
S6807	K0H1BA000432	SWITCH	1	
S6808	K0H1BA000432	SWITCH	1	
S6809	K0H1BA000432	SWITCH	1	
S6810	K0H1BA000432	SWITCH	1	

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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
S6811	K0H1BA000432	SWITCH	1	
S6812	K0H1BA000432	SWITCH	1	
S6813	K0H1BA000432	SWITCH	1	
S6814	K0H1BA000432	SWITCH	1	
S6815	K0H1BA000432	SWITCH	1	
S6816	K0H1BA000432	SWITCH	1	
S6817	K0H1BA000432	SWITCH	1	
S6818	K0H1BA000432	SWITCH	1	
T1101	G5ZZ00000071	TRANSFORMER	1	⚠
T1901	ETJV15ZE1KAB	TRANSFORMER	1	⚠
TH1634	VRT0139J103	THERMISTOR	1	D4CC11030005
TH6040	VRT0139J103	THERMISTOR	1	D4CC11030005
X3001	H0J270500080	CRYSTAL OSCILLATOR	1	
X6001	RSXY8M00M07T	CERAMIC OSCILLATOR	1	H2D800400005

20. Schematic Diagram for printing with A4

HP050300000HP

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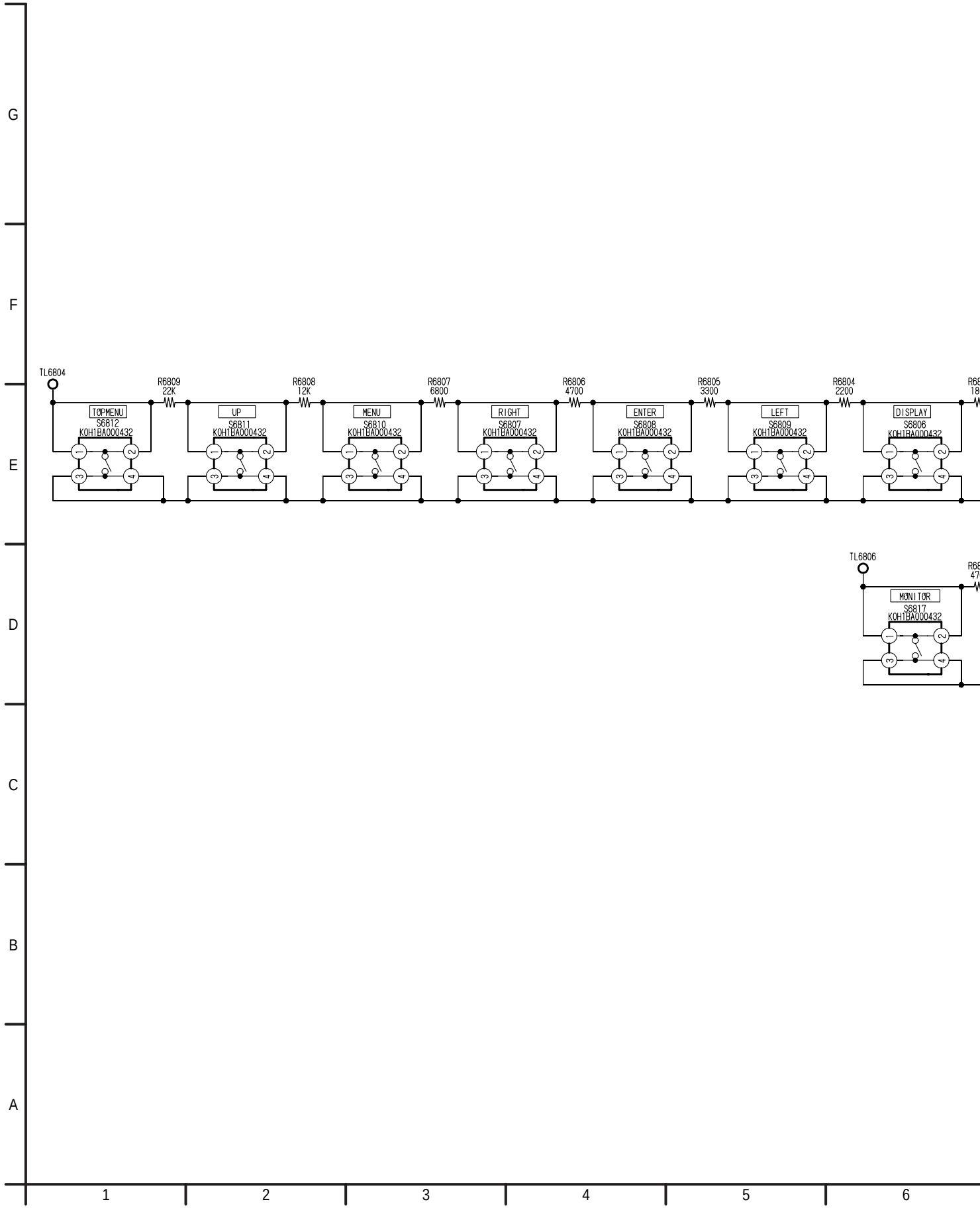
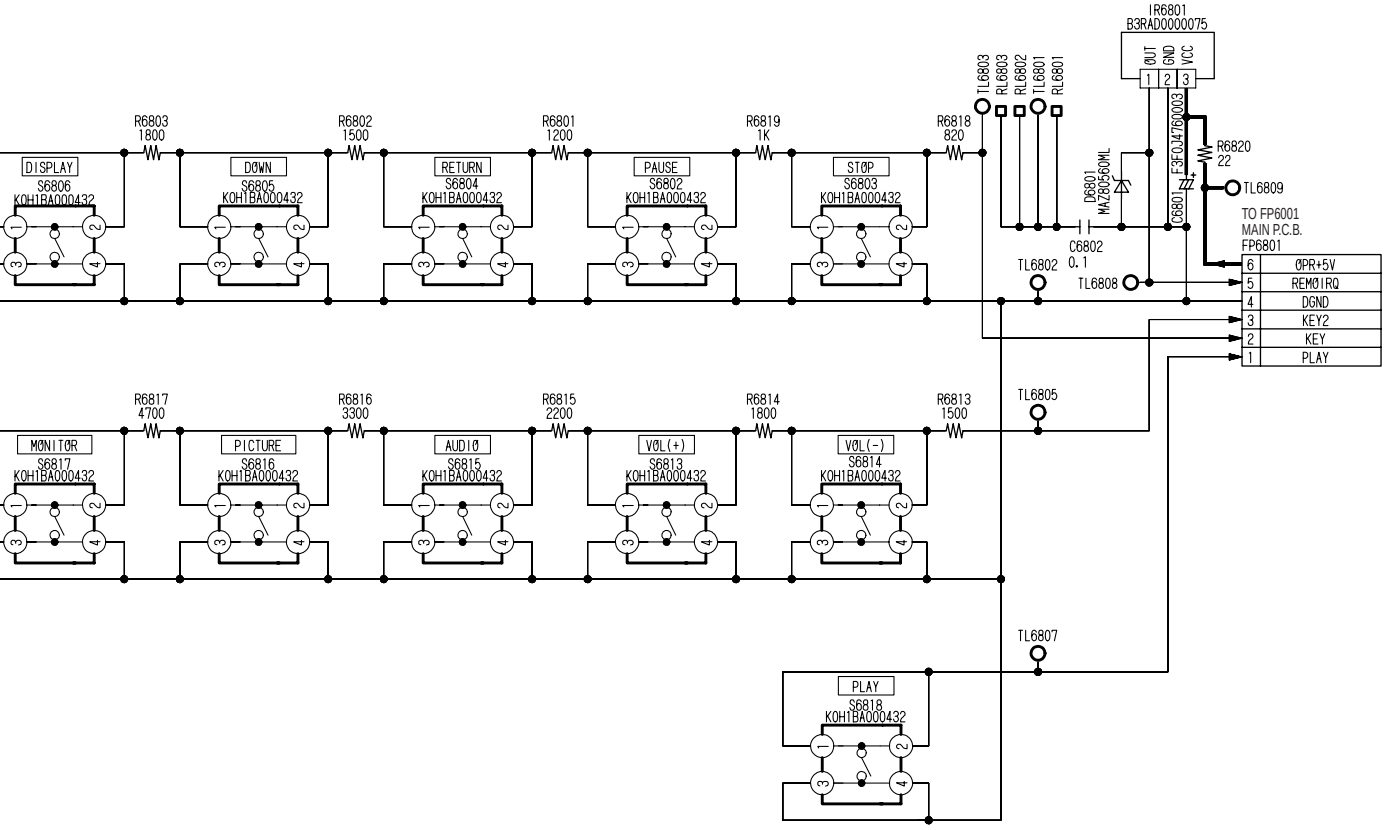
16.10. OPERATION SECTION (OPERATION P.C.B.) SCHEMATIC DIAGRAM

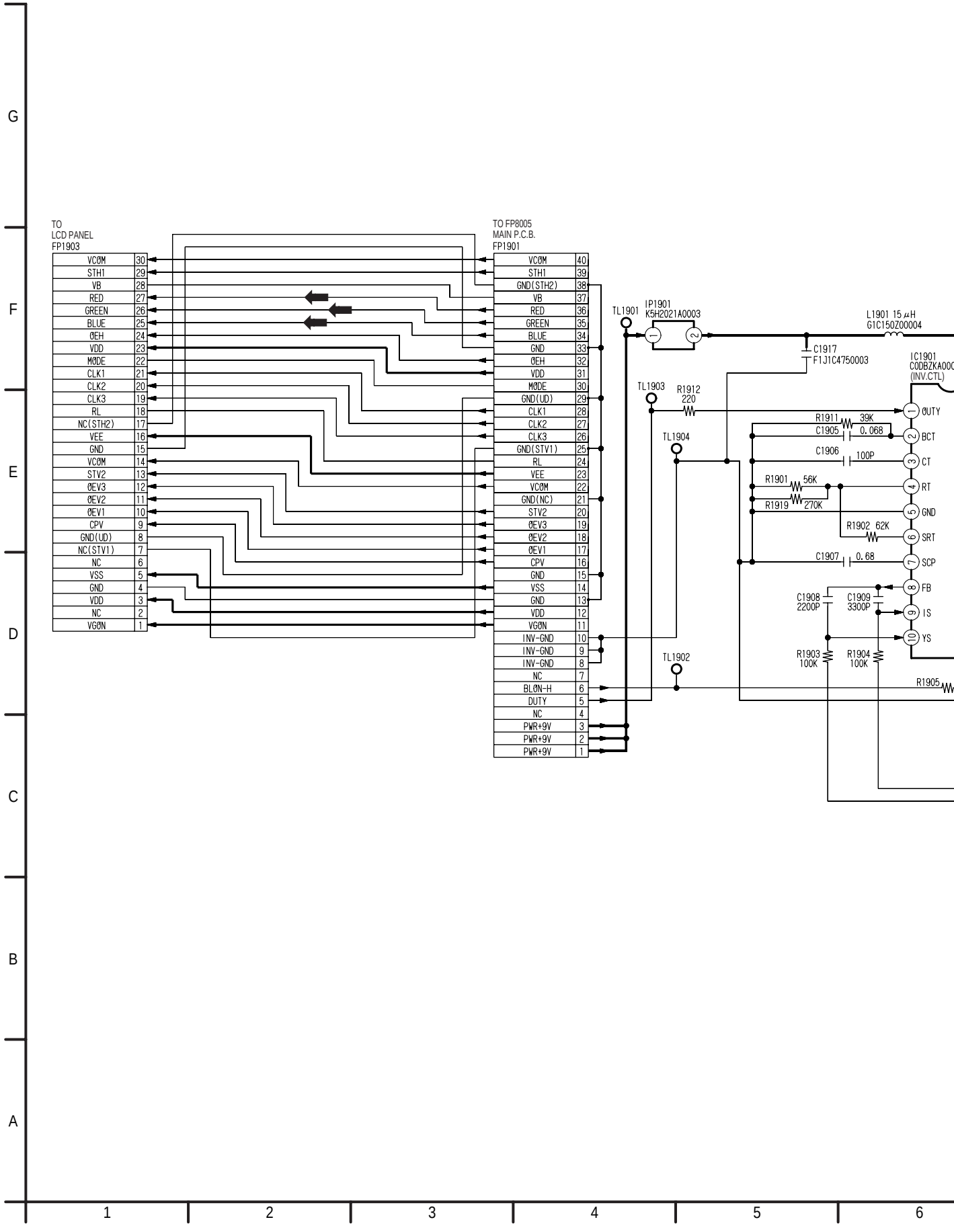




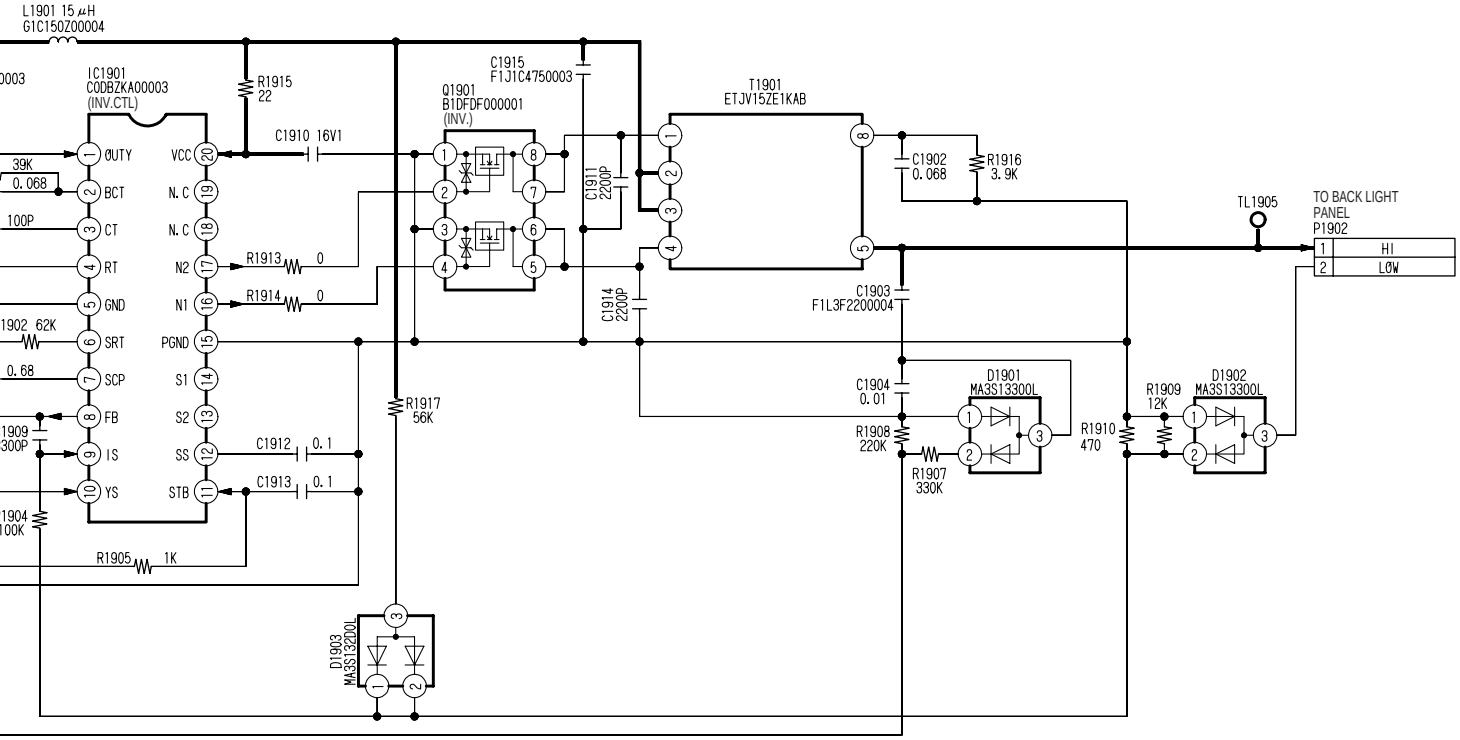
DVD-LS90PP/93P
OPERATION P.C.B.
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

16.11. INVERTER SECTION SCHEMATIC DIAGARAM



VIDEO SIGNAL



DVD-LS90PP/93P
INVERTER P.C.B.
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

Ref No.	IC1901																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	3.3	1.5	1.2	1.7	0.1	1.6	0.1	1.1	1.3	0.5	4.9	2.3	1.6	2.8	0.1	1.6	1.7	-	-	8.7
STOP	3.3	1.5	1.2	1.7	0.1	1.6	0.1	1.1	1.3	0.5	4.9	2.3	1.6	2.8	0.1	1.6	1.7	-	-	8.7

Ref No.	Q1901							
MODE	1	2	3	4	5	6	7	8
PLAY	0.1	1.7	0.1	1.6	9.9	9.8	9.4	9.4
STOP	0.1	1.7	0.1	1.6	9.9	9.8	9.4	9.4

Ref No.	IC1001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	0.6	9.1	9.1	8.2	0	0	6.3	9.1	3.6	0	0	0.2	2.2	1.8	1.1	1.4	1.0	1.0	2.1	1.1
STOP	0.4	9.1	9.1	8.2	0	0	6.3	9.1	3.6	0	0	0.2	2.2	1.8	1.0	1.3	1.0	1.0	2.1	1.1
Ref No.	IC1001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
PLAY	1.5	1.0	1.0	1.4	1.1	1.9	1.0	1.7	0	0	-	9.1	2.5	1.0	1.0	1.3	1.1	1.8	-	0
STOP	1.3	1.0	1.0	1.3	1.1	1.9	1.0	1.7	0	0	-	9.1	2.5	1.0	1.0	1.3	1.1	1.8	-	0
Ref No.	IC1001																			
MODE	41	42	43	44	45	46	47	48												
PLAY	-	1.0	0	0	5.0	5.0	5.0	0												
STOP	-	1.0	0	0	5.0	5.0	5.0	0												
Ref No.	IC1003							IC1004						IC1101						
MODE	1	2	3	4	5	6		1	2	3	4	5		1	2	3	4	5		
PLAY	5.0	0	1.3	4.9	0	5.3		5.3	0	5.3	-	5.0		5.3	0	5.0	0	5.0		
STOP	5.0	0	1.3	5.0	0	5.3		5.3	0	5.3	-	5.0		5.3	0	5.0	0	5.0		
Ref No.	IC1401									IC1411										
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5						
PLAY	7.4	0	-	1.2	11.8	8.0	0	11.7		5.0	0	10.9	5.0	10.4						
STOP	7.3	0	-	1.2	11.7	0	8.0	11.8		5.0	0	10.8	5.0	10.4						
Ref No.	IC1601																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
PLAY	1.3	1.6	5.0	9.4	4.6	0.3	1.0	1.0	1.4	0.5	4.5	0.3	6.3	6.2	0	9.0				
STOP	1.3	1.6	5.0	9.4	4.6	0.3	1.0	1.0	1.4	0.7	4.5	0.3	6.3	6.3	0	9.0				
Ref No.	IC2601																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	1.6	1.6	1.6	1.6	1.6	1.6	0	5.3	3.2	0	2.8	2.5	2.6	2.7	2.3	2.3	2.3	2.3	0	5.3
STOP	1.6	1.6	1.6	1.6	1.6	1.6	0	5.3	0	0	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3	0	0
Ref No.	IC2601																			
MODE	21	22	23	24	25	26	27	28												
PLAY	5.3	5.3	1.6	1.6	1.6	1.6	3.2	2.9												
STOP	5.3	5.3	1.6	1.6	1.6	1.6	0	2.8												
Ref No.	IC2651																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	-	2.5	-	2.5	-	-	2.5	0	2.9	2.9	2.9	2.9	2.9	2.9	0.8	0	0.6	0	2.5	0
STOP	-	0.1	-	0.1	-	-	0.1	0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0	0	0	5.0	5.0
Ref No.	IC2651																			
MODE	21	22	23	24	25	26	27	28												
PLAY	1.6	1.5	3.2	2.5	5.0	0	5.3	5.2												
STOP	1.6	1.6	0	5.0	5.0	0	5.3	5.3												
Ref No.	IC3001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	2.7	2.6	0	2.6	2.6	3.2	2.6	2.6	0	2.7	2.7	3.2	2.8	2.7	2.9	0	2.7	2.5	3.2	0
STOP	3.0	3.0	0	3.0	3.1	3.2	2.9	3.0	0	3.1	3.0	3.2	2.9	3.0	2.8	0	3.0	2.9	3.2	0
Ref No.	IC3001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
PLAY	0	3.2	2.2	1.4	0.9	1.1	0.8	3.2	0	1.8	0.8	0.7	2.3	3.2	0	1.8	1.8	1.7	1.4	1.3
STOP	0	3.2	2.8	1.4	0.6	1.1	0.5	3.2	0	2.7	0.4	0.5	2.7	3.2	0	2.3	2.1	2.5	1.2	0.9
Ref No.	IC3001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
PLAY	1.2	2.2	0.4	1.1	1.3	2.6	1.0	3.2	0	2.3	2.3	1.7	3.2	3.2	0	2.8	3.2	3.2	3.2	3.2
STOP	0.8	2.9	0.4	1.1	2.1	2.7	0.7	3.2	0	2.6	2.5	2.5	3.2	3.2	3.2	2.8	3.2	3.2	3.2	3.2
Ref No.	IC3001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
PLAY	0	3.2	0	0	3.2	2.9	0	2.9	2.6	3.1	0.1	1.9	3.2	0	1.6	1.4	1.6	1.6	0	0
STOP	0	3.2	0	0	0	3.0	0	2.9	2.7	3.1	3.2	3.2	3.2	0	1.6	1.6	1.6	1.6	0	0
Ref No.	IC3001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
PLAY	0	0	0	3.2	0	3.2	0	0	1.1	0	0	0	0	0	0	0	0	3.2	0.7	0
STOP	0	0	0	3.2	0	3.2	0	0	1.1	0	0	0	0	0	0	0	0	3.2	0.7	0
Ref No.	IC3001																			
MODE	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
PLAY	2.3	2.0	1.8	0.1	0	1.7	3.2	2.0	2.0	1.8	1.8	1.6	1.6	1.6	1.6	1.6	1.6	3.2	1.8	1.5
STOP	2.3	2.0	1.8	0.1	0	1.7	3.2	2.0	2.0	1.8	1.8	1.8	0	1.6	1.6	1.6	1.6	3.2	1.8	1.6
Ref No.	IC3001																			
MODE	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
PLAY	0	0	0.7	1.1	0.3	0.5	1.6	1.6	2.6	2.6	2.5	2.6	2.6	2.6	2.4	2.4	2.4	2.4	1.6	1.6
STOP	1.4	0	0	0	0	0	2.2	1.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.6	1.6

Ref No.	IC3001																				
MODE	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	
PLAY	3.2	1.2	1.8	2.1	0	1.6	1.6	1.5	0.5	3.2	0.4	0.4	1.3	1.3	2.1	0.5	0	0.8	3.2	0	
STOP	3.2	1.2	1.9	2.1	0	1.6	1.6	1.6	0.4	3.2	0.5	0.4	1.3	1.3	2.1	0.4	0	0.8	3.2	0	
Ref No.	IC3001																				
MODE	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	
PLAY	3.2	0	1.5	0	1.4	1.4	3.2	0.1	1.6	1.6	0.8	1.1	0	0	0	0.8	1.3	3.2	0	3.2	
STOP	3.2	0	1.5	0	1.4	1.4	3.2	0	1.6	1.6	0	1.1	0	0	0	0	1.3	3.2	0	3.2	
Ref No.	IC3001																				
MODE	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	
PLAY	0	3.2	0	0	0	0	0	0	0	3.2	0	0.9	1.6	0.8	1.3	3.2	1.0	1.3	1.3	1.3	
STOP	0	3.2	0	0	0	0	0	0	0	3.2	0	0.9	1.5	0.8	1.4	3.2	0.9	1.4	1.1	1.4	
Ref No.	IC3001																				
MODE	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	
PLAY	0	3.2	1.1	1.5	0	1.4	1.3	1.6	3.2	0.9	1.8	0.7	0	2.3	2.3	3.2	1.4	0	1.1	1.4	
STOP	0	3.2	1.0	1.4	0	1.4	1.6	1.7	3.2	1.0	1.8	0.8	0	2.8	2.8	3.2	2.1	0	1.1	1.5	
Ref No.	IC3001																				
MODE	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	
PLAY	0.4	0	1.6	0.5	3.2	1.7	0.3	1.6	0	0	3.2	1.5	0	1.7	0	1.1	0	0	3.2	2.9	
STOP	0.1	0	1.5	0.1	3.2	1.5	0.1	1.5	0	0	3.2	1.6	0	2.5	0	1.1	0	0	3.2	3.1	
Ref No.	IC3001																				
MODE	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256					
PLAY	1.6	0	1.5	3.1	3.1	3.2	0	3.1	2.3	0	2.3	2.6	0	2.6	3.2	2.8					
STOP	1.6	0	1.5	3.1	3.2	3.2	0	3.2	2.8	0	2.8	2.8	0	3.0	3.2	3.0					
Ref No.	IC3051																				
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
PLAY	3.2	2.7	3.2	2.7	2.7	0	2.7	2.6	3.2	2.6	2.7	0	2.5	3.2	2.3	3.1	3.1	3.1	3.0	1.7	
STOP	3.2	3.0	3.2	3.0	3.0	0	3.0	3.1	3.2	3.0	3.0	0	2.8	3.2	2.8	3.2	3.2	3.1	3.1	2.5	
Ref No.	IC3051																				
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
PLAY	1.6	0	0.3	0.5	0.5	2.9	3.2	0	1.4	1.5	1.7	1.6	0	0	0	-	3.2	1.6	2.3	-	
STOP	1.5	0	0.1	0.1	0.1	2.1	3.2	0	1.5	1.5	1.5	1.5	0	0	0	-	3.2	1.6	2.8	-	
Ref No.	IC3051																				
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54							
PLAY	0	2.6	3.2	2.6	2.7	0	2.7	2.8	3.2	2.7	3.0	0	2.5	0							
STOP	0	3.0	3.2	3.0	3.0	0	2.9	3.1	3.2	2.9	2.8	0	2.9	0							
Ref No.	IC3201																				
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
PLAY	4.9	0.2	0	2.1	5.0	0.8	0	1.6	2.1	0	1.7	0	2.1	5.0	2.1	4.9	2.2	2.2	0	2.2	
STOP	4.9	0.2	0	2.1	5.0	0.5	0	1.5	2.1	0	1.5	0	2.1	5.0	2.1	4.9	2.2	2.2	0	2.2	
Ref No.	IC3201																				
MODE	21	22	23	24	25	26	27	28	29	30	31	32									
PLAY	2.2	0	1.6	1.6	0	1.6	2.0	0	1.7	2.1	0.1	2.2									
STOP	2.2	0	1.4	1.4	0	1.4	1.6	0	1.5	1.7	0.1	2.2									
Ref No.	IC4001																				
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16					
PLAY	0	3.2	2.8	3.2	1.6	0.8	1.6	1.6	-	-	5.0	0	2.5	2.5	2.4	0					
STOP	0	3.2	2.8	3.2	1.6	0	1.6	1.6	-	-	5.0	0	2.5	2.5	2.4	5.0					
Ref No.	IC4002																				
MODE	1	2	3	4	5	6	7	8													
PLAY	4.2	4.2	4.2	0	4.2	4.2	4.2	8.5													
STOP	4.2	4.2	4.2	0	4.2	4.2	4.2	8.5													
Ref No.	IC4003																				
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
PLAY	0	0	3.3	3.3	0	3.3	0	0	1.6	1.6	0	1.6	1.6	0	1.6	3.3	1.6	1.6	1.6	0	
STOP	0	0	3.3	3.3	0	3.3	0	0	1.6	1.6	0	1.6	1.6	0	1.6	3.3	1.6	1.6	1.6	0	
Ref No.	IC4003																				
MODE	21	22	23	24	25	26	27	28													
PLAY	0	1.4	0	1.6	1.6	1.6	3.3	1.6													
STOP	0	1.4	0	1.6	1.6	1.6	3.3	1.6													
Ref No.	IC4009						IC5201														
MODE	1	2	3	4	5		1	2	3	4	5	6	7	8							
PLAY	5.3	0	5.3	-	5.0		0	0	0	0	3.2	0	0.3	3.2							
STOP	5.3	0	5.3	-	5.0		0	0	0	0	3.2	0	0	3.2							
Ref No.	IC6001																				
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
PLAY	5.0	5.0	1.7	4.5	0.3	5.0	5.0	5.0	2.5	2.4	0	0	5.0	0	5.0	0.1	0.1	0	5.0	4.9	
STOP	5.0	5.0	1.6	4.5	0.3	5.0	5.0	5.0	2.5	2.4	0	0	5.0	0	5.0	0.1	0.1	0	5.0	5.0	
Ref No.	IC6001																				
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
PLAY	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	-	-	-	-	-	-	-	-	0	5.0	
STOP	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	-	-	-	-	-	-	-	-	0	5.0	
Ref No.	IC6001																				
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
PLAY	0	5.0	0	5.0	5.0	5.0	5.0	5.0	0	5.0	5.0	5.0	0	0	0	0	0	3.1	4.1	4.5	
STOP	0	5.0	0	5.0	5.0	5.0	5.0	5.0	0	5.0	5.0	5.0	0	0	0	0	0	3.1	4.2	4.5	
Ref No.	IC6001					IC6002															
MODE	61	62	63	64		1	2	3	4	5											
PLAY	5.0	5.0	0.2	1.4		0	0	0	0	3.3											
STOP	5.0	5.0	0.2	1.4		0	0	0	0	3.3											
Ref No.	IC6006																				
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14							
PLAY	3.3	3.3	5.0	0	0	0	0	4.5	2.9	2.9	4.1	2.7	2.7	5.0							
STOP	3.3	3.3	5.0	0	0	0	0	4.5	2.9	2.9	4.2	2.7	2.7	5.0							

Ref No.	IC6201																			
MODE	1	2	3																	
PLAY	0	3.2	3.2																	
STOP	0	3.2	3.2																	

Ref No.	IC6301																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	2.6	0.7	2.3	0.8	1.0	2.3	1.1	0.9	2.2	-	3.2	3.2	-	-	-	0	0	0	3.2	3.2
STOP	2.7	0.6	2.9	0.5	0.7	2.7	0.8	0.6	2.1	-	3.2	3.2	-	-	-	0.4	0.4	2.6	2.3	0.9

Ref No.	IC6301																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
PLAY	0	0	3.2	3.2	2.2	1.7	0	1.7	0.8	0.9	1.0	0.8	1.4	1.1	1.5	1.4	3.2	1.2	1.2	1.3
STOP	1.4	2.5	2.1	1.2	2.8	2.5	0	2.5	0.7	0.6	0.9	0.7	1.6	0.8	1.5	1.0	3.2	1.5	0.9	1.4

Ref No.	IC6301								IC6351											
MODE	41	42	43	44	45	46	47	48		1	2	3	4	5	6	7	8			
PLAY	1.4	1.3	1.6	1.6	1.7	0	3.2	1.7		0	0	0	0	3.2	3.2	0	3.2			
STOP	1.4	1.4	1.7	1.5	1.8	0	3.2	2.7		0	0	0	0	3.2	3.2	0	3.2			

Ref No.	IC8001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	2.8	0.7	0.6	2.1	2.1	5.1	2.1	0	0	0	3.4	3.5	3.4	0	0	0	0	0.7	2.6	2.5
STOP	2.9	0.5	0.5	2.1	2.1	5.1	2.1	0	0	0	3.3	3.4	3.4	0	0	0	0	0	2.6	2.5

Ref No.	IC8001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
PLAY	2.6	2.5	0	2.5	7.5	2.6	2.5	4.1	3.3	3.3	3.3	3.1	0.9	0.5	3.3	1.7	0	0	4.9	3.1
STOP	2.6	2.5	0	2.5	7.5	2.6	2.5	4.1	3.3	3.3	3.3	3.1	0.9	0.5	3.3	1.7	0	0.1	4.9	3.1

Ref No.	IC8001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
PLAY	0	2.8	1.8	5.1	0	3.8	5.0	5.0	3.0	1.6	1.3	3.0	2.3	2.7	2.7	3.7	2.1	5.1	0	2.5
STOP	0	2.8	1.8	5.1	0.1	3.5	5.0	5.0	3.0	1.6	1.3	2.9	2.3	0	2.7	3.7	2.1	5.1	0	2.5

Ref No.	IC8001																			
MODE	61	62	63	64																
PLAY	2.6	1.4	2.1	2.7																
STOP	2.6	1.4	2.1	2.9																

Ref No.	IC8201																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	0.5	3.1	0.2	2.6	3.3	3.1	3.3	0.7	0.2	3.3	3.3	0.1	3.2	1.7	0	0.6	0.1	0.1	0.1	0.9
STOP	0.5	3.1	0.1	0	3.3	3.1	3.3	0	0.1	3.3	3.3	0	2.3	1.7	0	0.6	0.1	0.1	0.1	1.7

Ref No.	IC8201																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
PLAY	0.2	0	0	1.3	1.4	0	1.4	3.2	1.4	3.2	0.2	3.3	1.6	0	3.3	1.7	1.6	0	3.3	3.2
STOP	0.4	0	0	1.7	1.3	0	1.2	3.3	1.2	3.3	0.1	3.3	1.6	0	3.3	1.7	1.6	0	3.3	3.3

Ref No.	IC8201																			
MODE	41	42	43	44	45	46	47	48												
PLAY	0	0.1	3.3	3.3	0.1	0	3.3	0												
STOP	0	0.1	3.3	3.3	0.1	0	3.3	0												

Ref No.	IC8202								IC8401											
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8			
PLAY	0.5	0.1	0.1	0	3.3	3.2	3.1	3.3		0	0	0	0	5.0	5.0	0	5.1			
STOP	0.5	0.1	0.1	0	3.3	3.2	3.1	3.3		0	0	0	0	5.0	5.0	0	5.1			

Ref No.	IC8403								IC8602											
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8			
PLAY	-2.5	-2.5	-2.5	-12.7	1.5	1.6	1.6	7.5		1.9	1.6	1.5	0	1.3	1.3	8.5	16.8			
STOP	-2.5	-2.5	-2.5	-12.6	1.5	1.6	1.6	7.5		1.8	1.6	1.5	0	1.3	1.3	8.5	16.8			

Ref No.	IC8801				IC8802															
MODE	1	2	3		1	2	3													
PLAY	5.1	0	7.5		3.3	5.0	0													
STOP	5.1	0	7.5		3.3	5.0	0													

Ref No.	Q1001							Q1002							Q1003					
MODE	1	2	3	4	5	6		1	2	3	4	5	6		1	2	3	4	5	6
PLAY	1.1	1.1	8.2	9.1	1.1	1.1		2.6	2.6	6.3	9.1	2.6	2.6		5.3	5.3	3.6	9.1	5.3	5.3
STOP	1.1	1.1	8.2	9.1	1.1	1.1		2.6	2.6	6.3	9.1	2.6	2.6		5.3	5.3	3.6	9.1	5.3	5.3

Ref No.	Q1101				Q1402									Q1412				Q1621		
MODE	1	2	3		1	2	3	4	5	6	7	8		E	C	B		E	C	B
PLAY	0.2	0	10.1		11.8	11.8	11.8	7.9	7.4	7.4	7.4	7.4		11.3	11.1	10.6		9.4	6.7	9.0
STOP	0.2	0	9.8		12.1	12.1	12.1	12.1	1.3	1.3	1.3	1.3		11.3	11.1	10.6		9.4	6.4	9.0

Ref No.	Q1622				Q4001				Q4002				Q5201				Q5202			
MODE	S	D	G		E	C	B		E	C	B		E	C	B		E	C	B	
PLAY	0	0	5.0		8.5	9.1	9.1		0	3.1	0		0.5	3.7	1.1		0	4.9	0	
STOP	0	0	5.0		8.4	9.1	9.1		0	3.1	0		0	4.9	0.1		0	4.9	0.1	

Ref No.	Q5211				Q5215				Q8001				Q8002							
MODE	1	2	3		E	C	B		E	C	B		1	2	3	4	5	6		
PLAY	3.7	4.3	2.3		4.9	4.9	0.1		0.7	0	0		3.0	2.8	5.1	2.5	3.2	5.1		
STOP	4.9	4.9	0		4.9	4.9	0.3		0.7	0	0		2.9	2.8	5.1	2.3	2.9	5.1		

Ref No.	Q8201							Q8401												
MODE	1	2	3	4	5	6		1	2	3	4	5	6							
PLAY	0.5	0.5	0.5	0.5	1.0	3.1		7.3	0.9	1.4	-12.4	2.1	1.5							
STOP	0.5	0.5	0.6	0.5	1.0	3.1		7.3	1.0	1.5	-12.4	2.0	1.5							

Ref No.	Q8406																			
MODE	1	2	3	4	5	6														
PLAY	7.5	1.5	2.1	-12.6	1.5	0.9														
STOP	7.5	1.5	2.0	-12.6	1.5	1.0														

Ref No.	QR1007				QR1008				QR1402				QR1411							
MODE	E	C	B		E	C	B		E	C	B		1	2	3	4	5	6		
PLAY	0	5.0	0		0	5.0	0.5		0	0	4.2		5.1	0.2	0.1	4.1	0	11.3		
STOP	0	5.0	0		0	5.0	0.5		0	0	4.2		5.1	0.2	0.1	4.1	0	11.3		

Ref No.	QR1413				QR1601								Q4001				QR4002			
MODE	E	C	B		1	2	3	4	5				E	C	B		E	C	B	
PLAY	9.1	0	9.0		0	0	0	1.3	5.0				0	0	5.0		9.1	9.1	7.8	
STOP	9.1	0	9.0		0	0	0	1.3	5.0				0	0	5.0		9.1	9.1	7.8	
Ref No.	QR4003				QR4004						QR4005						QR4006			
MODE	E	C	B		1	2	3	4	5		1	2	3	4	5		E	C	B	
PLAY	4.3	-2.0	4.2		0.1	0	5.0	0	4.2		0	0	0	0.6	0.6		4.3	4.2	0	
STOP	4.3	4.3	0		0.1	0	5.0	0	0		0	0	0	0	0		4.3	4.2	0	
Ref No.	QR4007				QR4008				QR4009								QR4011					
MODE	E	C	B		E	C	B		1	2	3	4	5		1	2	3	4	5	6
PLAY	3.2	-1.0	3.1		0	0.1	3.1		0	0	0	4.2	4.2		0	-0.6	0	0	-0.6	0
STOP	3.2	-0.7	3.1		0	0.1	3.1		3.2	0	5.0	0	0		0	0.7	0	0	0.7	0
Ref No.	QR4012							QR4013							QR5221					
MODE	1	2	3	4	5	6		1	2	3	4	5	6		E	C	B			
PLAY	0	0.7	0	0	0.7	0		0	0.7	0	0	0.7	0		3.2	3.2	0.1			
STOP	0	0.7	0	0	0.7	0		0	0.7	0	0	0.7	0		3.2	-0.8	0.1			

TRAVERSE MECHANISM UNIT

MAIN P.C.B.

PICK-UP UNIT

SPINDLE MOTOR

IC2651

SPINDLE MOTOR DRIVE

TRAVERSE MOTOR

IC2601

TRAVERSE MOTOR DRIVE

FOCUS COIL

TRACKING COIL

IC6301

16Mbit FLASH ROM

IC3001

DV2.1

RF SIGNAL PROCESSOR/
AV DECODER/
SERVO CONTROLLER/
OPTICAL DISC CONTROLLER/
SYSTEM CONTROLLER

IC4001

AUDIO D/A CONVERTER

IC4003

AUDIO POWER AMP DC VOLUME CONTROL

SPEAKER

HEADPHONE

AUDIO OUT

OPT OUT

IC6001

LED

REMOTE CONTROL

KEY

OPERATION MPU

IC6351

8Kbit EEP ROM

IC3051

64Mbit SDRAM

IC3201

VIDEO DRIVE

IC8001

VIDEO SIGNAL PROCESSOR

LCD

VIDEO OUT

DVD-LS90PP/93P
OVERALL BLOCK DIAGRAM

IC3001-171
5.5Vp-p(5usec./div.)

IC4001-14,15
4.0Vp-p(0.5msec./div.)

:AUDIO SIGNAL

IC3001
(DV2.1)

IC4001
(AUDIO DAC)

IC4003
(AUDIO POWER AMP/DC VOLUME CONTROL)

ADOUT3
(DMIX OUT) 171
SRCK 170
LRCK 169
DATA 6
RCK 7
LRCK 8
AUDIO SERIAL PORT
CONTROLLER
MODULATOR
D/A
LPF
14 VOUTR
SCK 5
SYSTEM CLOCK MANAGER
DACCK
(DACSCK) 163
D/A
LPF
15 VOUTL
16 ZERR/ ZEROA
IECOUT 177
P13
(AMUT) 55
QR4009(1/2) BUFFER
QR4009(1/2) BUFFER

R-IN 10
L-IN 12
BIAS
VOLUME CONTROL
QR4005(1/2) SIGNAL LEVEL CTRL
QR4005(1/2) SIGNAL LEVEL CTRL
HPSENSE 21
MODE CONTROL
DC VOL 7
S-DOWN 2
POWER MANAGEMENT
19 18 24 25
BIAS
26 R-OUT-
28 R-OUT+
15 L-OUT+
17 L-OUT-
SPEAKER R
SPEAKER L

JK4003
HEAD PHONE
JK4002
HEAD PHONE

IC6001
(OPERATION MPU)

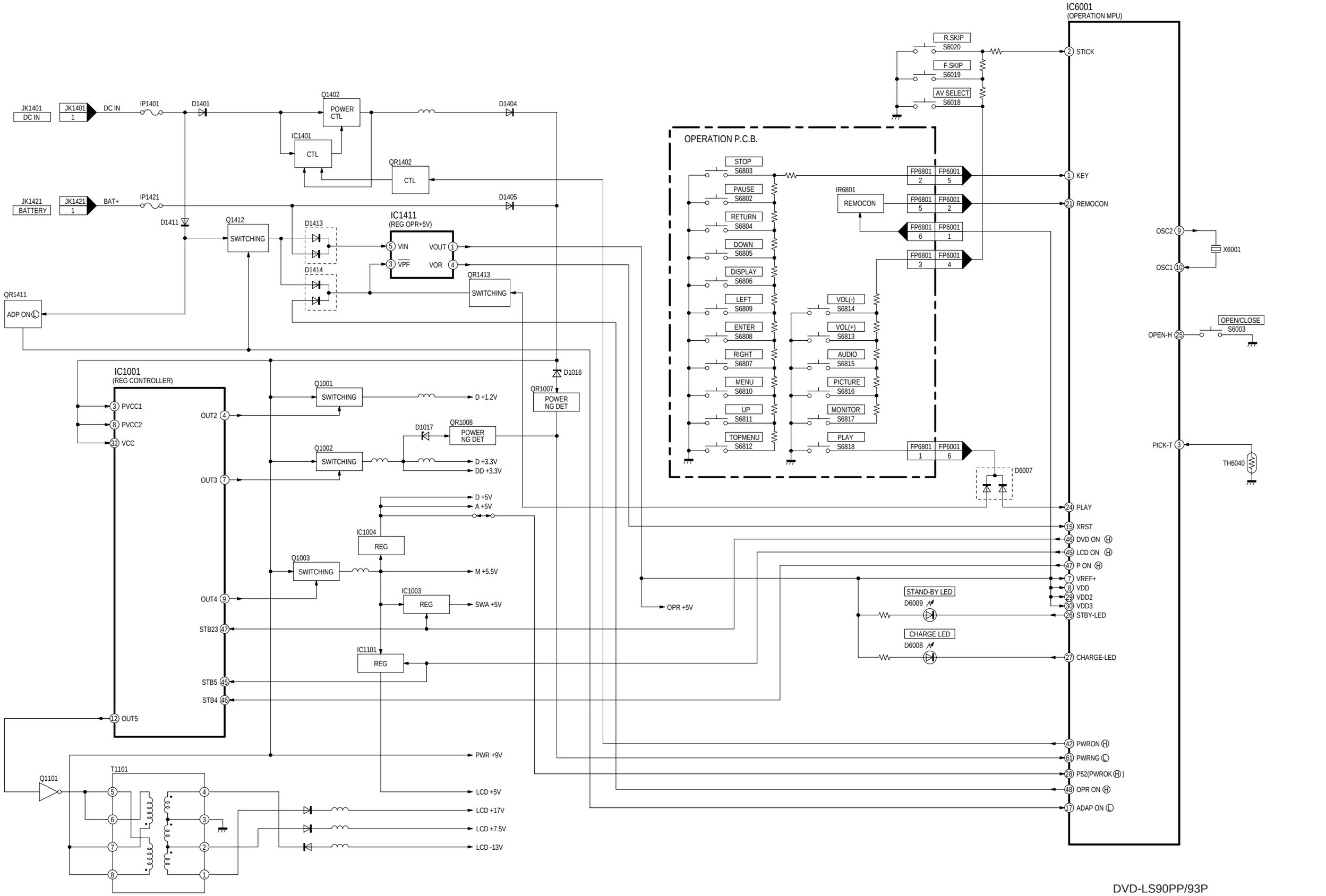
HPSENSE-H 39
DCVOL 18
IC6002
P10
(POWER MUT) 16
HPMUT-H 40
HPJOPEN-H 23

QR4008 MUTE
QR4007 MUTE
Q4002 JACK-IN DET.
D+3.3V
JK4001
OPT OUT
AUDIO OUT

QR4004(1/2) BUFFER
QR4004(1/2) BUFFER
IC4002(1/2)
IC4002(1/2)
QR4003 MUTE CTRL
D4001
QR4011 (1/2) MUTE
QR4011 (1/2) MUTE

QR4006 MUTE CTRL
QR4012(1/2) MUTE
QR4012(1/2) MUTE
QR4013(1/2) MUTE
QR4013(1/2) MUTE

DVD-LS90PP/93P
AUDIO BLOCK DIAGRAM



DVD-LS90PP/93P
POWER SUPPLY BLOCK DIAGRAM

RF SIGNAL
MOTOR DRIVE SIGNAL
TRACKING ERROR SIGNAL
FOCUS ERROR SIGNAL

OPTICAL PICK UP UNIT
PHOTO DETECTOR
B1 B2 A1 A2 A4 A3 B4 B3
HEAD AMP
LASER DIODE
LASER DIODE
Q5201,Q5211
LD DRIVE
Q5202,Q5215
LD DRIVE

IC3001 (DV2.1)
VIN5 134
VIN6 133
VIN7 132
VIN8 131
VIN1 138
VIN2 137
VIN3 136
VIN4 135
VREF 127
LPCO1 124
LPC1 123
LPCO2 126
LPC2 125
RFINN 110
RFINP 111
PWM1 147 TRDRV
PWM0 148 FODRV
DRV0 75 TRVDRV
P7 61 ACTMUT-L

IC2601
(TRAVERSE MOTOR DRIVE)
2 VIN1
3 VIN2
23 VIN3
27 CH3 MUTE
9 CH1,2 MUTE
LEVEL SHIFT
VO3+ 17 DC1
VO3- 18 DC2
TRAVERSE MOTOR
BIAS1
LEVEL SHIFT
LEVEL SHIFT
VO1+ 14
VO1- 13
VO2+ 12
VO2- 11

IC2601-11,12,13,14
0.4Vp-p(0.5usec./div.)

OPTICAL PICK UP UNIT
ACTUATOR
TRACKING COIL
FOCUS COIL
TR+
TR-
FO+
FO-

SPINDLE MOTOR UNIT
IC2651
(SPINDLE MOTOR DRIVE)
2 A3
4 A2
7 A1
DRIVER
GAIN CONTROL
RNF 28 M+5.5V
CURRENT SENSE AMP
HALL AMP
9 H1+
10 H1-
HALL1
TL
TSD
PS 23 PS SS 65 P6
TORQUE SENS AMP
11 H2+
12 H2-
HALL2
EC 22 SPDRV 76 DRV1
D R Q CK Q̄
VCC
ECR 21 VHALF 128
13 H3+
14 H3-
HALL3
FG 24 FG 72
TRV-SW+ 58 P10
IC2651-24
5.0Vp-p(5msec./div.)
TRAVERSE SW

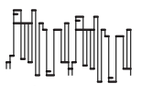
DVD-LS90PP/93P
SERVO BLOCK DIAGRAM

IC8001-57
1.2Vp-p
(20usec./div.)

IC8001-52
1.1Vp-p
(20usec./div.)

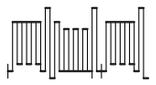
:VIDEO SIGNAL

IC8001-26
4.0Vp-p
(20usec/div.)

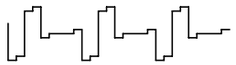


IC8001-21
4.0Vp-p
(20usec/div.)

IC8001-19
3.8Vp-p
(20usec/div.)



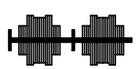
IC3001-152
0.6Vp-p(20usec./div.)



IC3001-151
0.6Vp-p(20usec./div.)

IC3001-149
1.0Vp-p(20usec./div.)

IC3001-158
0.6Vp-p(20usec./div.)



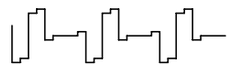
IC3001-156
1.0Vp-p(20usec./div.)

IC8001 (VIDEO SIGNAL PROCESSOR)

Q8001
AMP
Y IN 52
C IN 57
TRAP
PICTURE CONTROL
GCA
BPF
ACC
DEMOD
KILLER
APC
TINT
VXO GENE
VXO
XTAL 63
B-Y IN 5
R-Y IN 4
N P N P
GCA
R-Y
B-Y
MATRIX
R
G
B
INT/EXT SW
INVERT
SYNC SEP
SYNC IN 46
CSYNC 34
VDIN 35
POL 36
VCOM 28
AMP
AMP
AMP
R-OUT 26
G-OUT 21
B-OUT 19
VCOM
IC8403
2
1
Q8406,8401
BUFFER
LCD PANEL
SOURCE DRIVER
RED
GREEN
BLUE
VCOM
OEH
STH1
CLK1
CLK2
CLK3
LCD C
LCD Y
Q8002
AMP
VJIN-L
TO IC6001-63pin
JK3201
VIDEO OUT
TO IC6001-52pin
MUTE1
TO IC6001-51pin
MUTE2
IC3001
(DV2.1)
DAC5OUT 158
VCOUT
DAC4OUT 156
VYOUT
DAC1OUT 149
PYOUT
DAC2OUT 151
PBOUT
DAC3OUT 152
PROUT
IC3201 (VIDEO DRIVE)
CIN 4
YIN 8
PY/GIN 11
PB/BIN 13
PR/RIN 15
BIAS
CLAMP
6dB
6MHz LPF
12MHz LPF
75Ω
MUTE1 5
MUTE2 14
CVOUT 30 29
PY/GOUT 24 23
PB/BOUT 21 20
PR/ROUT 18 17
H
L
IC8201 (CONTROLLER)
SYNC IN 1
POL 14
OEH 21
HD IN 2
VDB IN 5
TP
PO
MS
HC
NL
FH
VC
STH1 23
CPH1 29
CPH2 27
CPH3 25
CPV 16
OEV3 17
OEV2 18
OEV1 19
STV2 26
IC8202
Q8201
GATE DRIVER

IC3201-21
1.2Vp-p(20usec./div.)

IC3201-18
1.2Vp-p(20usec./div.)

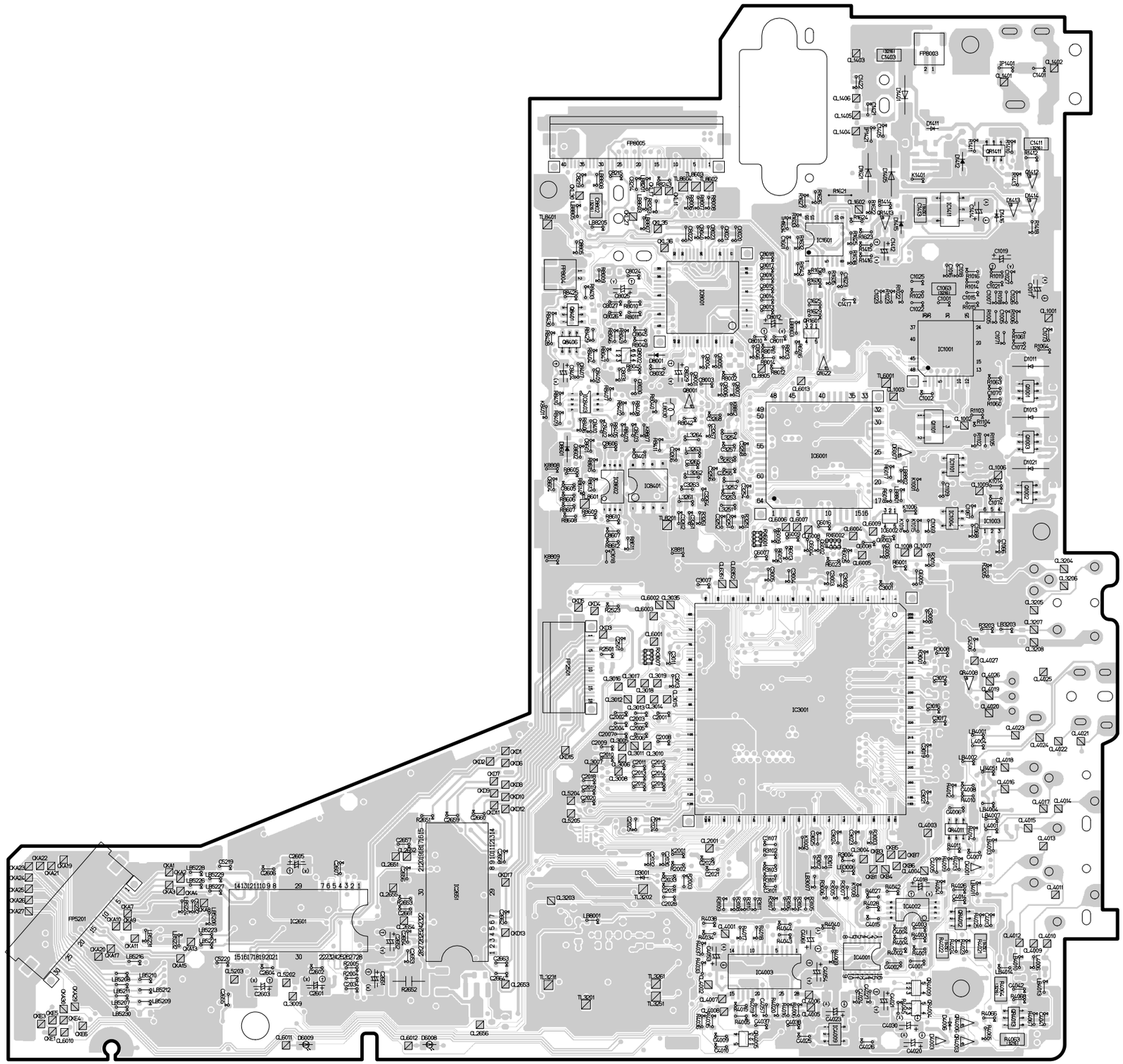


IC3201-30
2.0Vp-p(20usec./div.)

IC3201-24
2.0Vp-p(20usec./div.)

DVD-LS90PP/93P
VIDEO BLOCK DIAGRAM

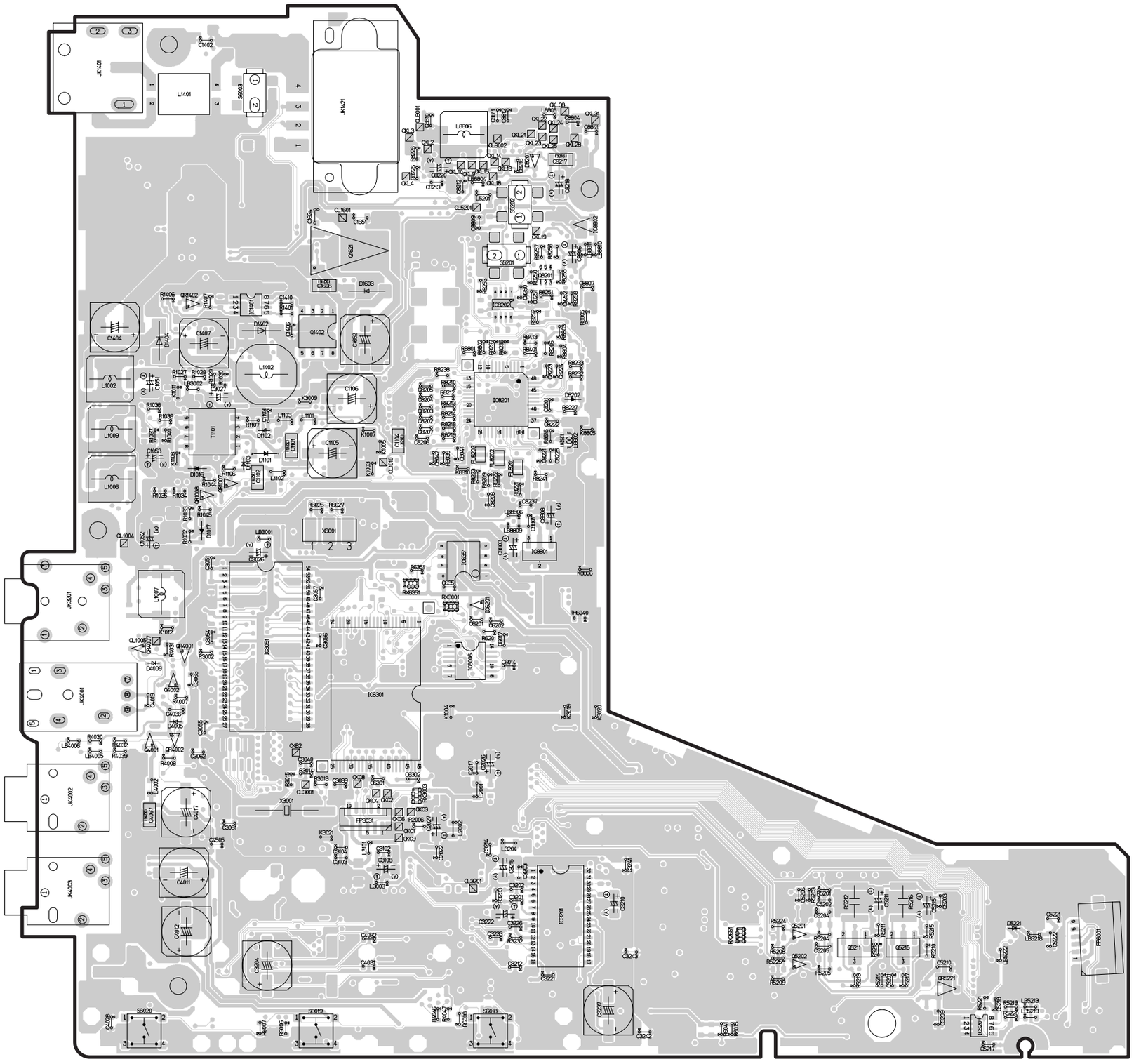
MAIN P.C.B. (1/2)



(COMPONENT SIDE)

DVD-LS90PP/93P
MAIN P.C.B. (1/2)
(RFKBLS90MP)

MAIN P.C.B. (2/2)



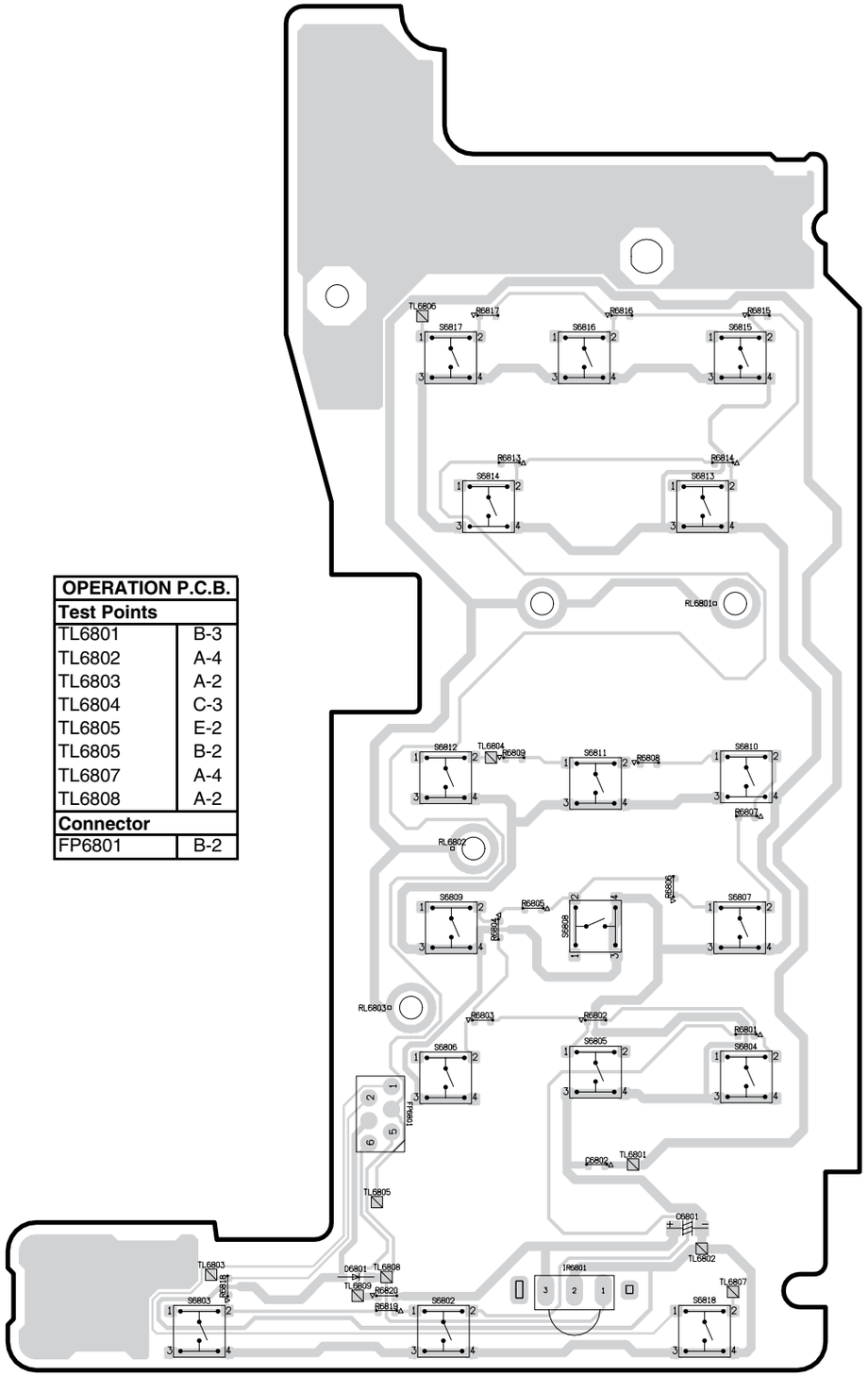
(FOIL SIDE)

MAIN P.C.B.											
Transistors			IC3051	C-2	F	CL3007	B-4	C	CL5204	B-4	C
Q1001	D-6	C	IC3201	B-4	F	CL3008	B-4	C	CL5205	B-4	C
Q1002	D-6	C	IC4001	A-5	C	CL3009	A-2	C	CL6001	C-4	C
Q1003	D-6	C	IC4002	B-6	C	CL3010	B-4	C	CL6002	C-4	C
Q1101	D-6	C	IC4003	A-5	C	CL3011	B-4	C	CL6003	C-4	C
Q1402	E-2	F	IC4009	A-5	C	CL3012	C-4	C	CL6004	D-5	C
Q1412	E-6	C	IC5201	A-6	F	CL3013	C-4	C	CL6005	C-5	C
Q1621	E-3	F	IC6001	D-5	C	CL3014	C-4	C	CL6006	D-5	C
Q1622	D-5	C	IC6002	D-5	C	CL3015	C-4	C	CL6007	D-5	C
Q4001	B-2	F	IC6006	C-3	F	CL3016	C-4	C	CL6008	D-5	C
Q4002	C-2	F	IC6201	C-3	F	CL3017	C-4	C	CL6009	D-5	C
Q5201	A-5	F	IC6301	C-3	F	CL3018	C-4	C	CL6010	A-1	C
Q5202	A-5	F	IC6351	C-3	F	CL3019	C-4	C	CL6011	A-2	C
Q5211	A-5	F	IC8001	E-4	C	CL3035	C-4	C	CL6012	A-3	C
Q5215	A-5	F	IC8201	D-3	F	CL3201	B-3	F	CL6013	D-5	C
Q8001	D-4	C	IC8202	E-3	F	CL3203	B-4	C	CL6351	C-5	C
Q8002	D-4	C	IC8401	D-4	C	CL3204	C-6	C	CL6352	C-5	C
Q8201	E-4	F	IC8403	D-4	C	CL3205	C-6	C	CL8001	F-3	F
Q8401	E-4	C	IC8602	D-4	C	CL3206	C-6	C	CL8002	F-3	F
Q8406	E-4	C	IC8801	C-4	F	CL3207	C-6	C	CL8805	D-5	C
Transistors-resistors			IC8802	E-4	F	CL3208	C-6	C	TL3201	A-4	C
QR1007	D-2	F	**Test Points**			CL4001	A-5	C	TL3202	B-4	C
QR1008	D-2	F	CL1001	E-6	C	CL4002	A-4	C	TL3231	A-4	C
QR1402	E-2	F	CL1002	D-6	C	CL4003	B-6	C	TL3251	A-4	C
QR1411	E-6	C	CL1003	D-5	C	CL4004	B-6	C	TL3261	A-4	C
QR1413	E-5	C	CL1004	C-1	F	CL4005	A-5	C	TL6001	D-5	C
QR1601	E-5	C	CL1005	C-2	F	CL4006	A-5	C	TL8201	D-4	C
QR4001	C-2	F	CL1006	D-6	C	CL4007	A-5	C	TL8401	E-4	C
QR4002	B-2	F	CL1007	C-6	C	CL4008	A-5	C	TL8601	D-4	C
QR4003	A-6	C	CL1008	C-5	C	CL4009	A-6	C	TL8602	E-4	C
QR4004	A-6	C	CL1009	D-6	C	CL4010	A-6	C	TL8603	E-4	C
QR4005	A-5	C	CL1010	D-3	F	CL4011	B-6	C	TL8604	E-4	C
QR4006	A-6	C	CL1401	F-6	C	CL4012	A-6	C	**Connectors**		
QR4007	C-1	F	CL1402	F-6	C	CL4013	B-6	C	FP2501	C-4	C
QR4008	C-6	C	CL1403	F-5	C	CL4014	B-6	C	FP3031	B-3	F
QR4009	A-6	C	CL1404	F-5	C	CL4015	B-6	C	FP5201	B-1	C
QR4011	B-6	C	CL1405	F-5	C	CL4016	B-6	C	FP6001	A-6	F
QR4012	B-6	C	CL1406	F-5	C	CL4017	B-6	C	FP8003	F-6	C
QR4013	A-6	C	CL1601	E-3	F	CL4018	B-6	C	FP8004	E-4	C
QR5221	A-6	F	CL1602	E-5	C	CL4019	C-6	C	FP8005	F-4	C
Integrated Circuits			CL2001	B-4	C	CL4020	C-6	C			
IC1001	D-6	C	CL2651	B-3	C	CL4021	B-6	C			
IC1003	D-6	C	CL2652	B-3	C	CL4022	B-6	C			
IC1004	D-6	C	CL2653	A-3	C	CL4023	B-6	C			
IC1101	D-6	C	CL2654	B-3	C	CL4024	B-6	C			
IC1401	E-2	F	CL2655	B-3	C	CL4025	C-6	C			
IC1411	E-6	C	CL2656	A-3	C	CL4026	C-6	C			
IC1601	E-5	C	CL3001	B-2	F	CL4027	C-6	C			
IC2601	B-2	C	CL3004	B-5	C	CL5201	E-3	F			
IC2651	B-3	C	CL3005	B-4	C	CL5202	A-2	C			
IC3001	C-5	C	CL3006	B-4	C	CL5203	A-2	C			

ADDRESS INFORMATION
C…COMPONENT SIDE
F…FOIL SIDE

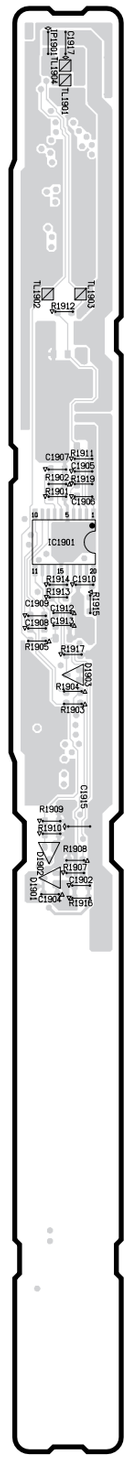
DVD-LS90PP/93P
MAIN P.C.B. (2/2)
(RFKBLS90MP)

OPERATION P.C.B.



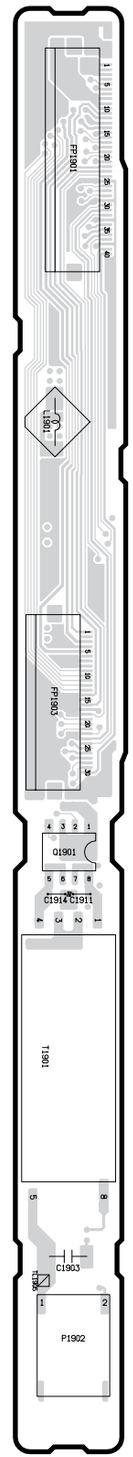
OPERATION P.C.B.	
Test Points	
TL6801	B-3
TL6802	A-4
TL6803	A-2
TL6804	C-3
TL6805	E-2
TL6805	B-2
TL6807	A-4
TL6808	A-2
Connector	
FP6801	B-2

INVERTER P.C.B. (1/2)



(COMPONENT SIDE)

INVERTER P.C.B. (2/2)

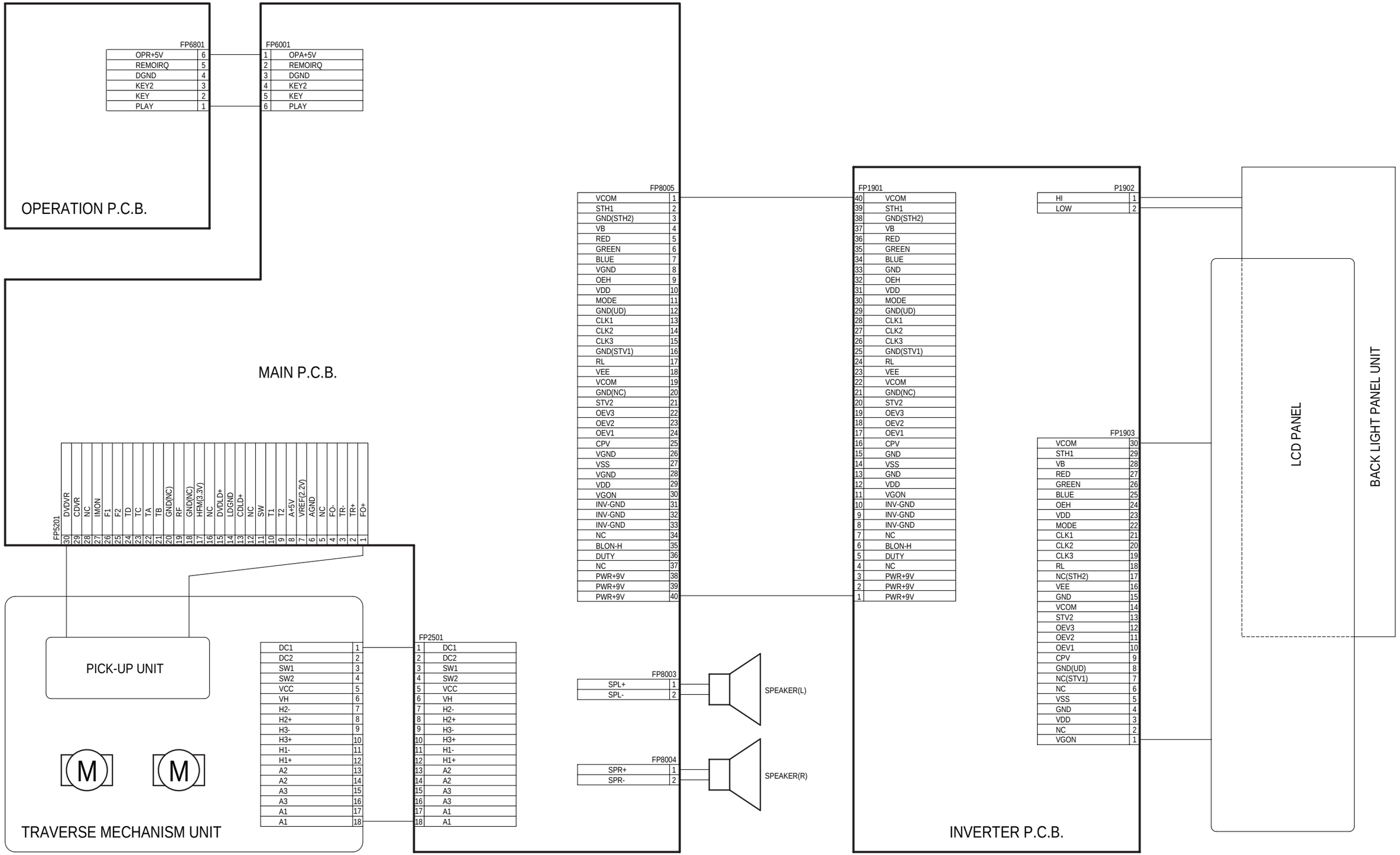


(FOIL SIDE)

LCD P.C.B.		
Transistor		
Q1901	C-7	F
Integrated Circuit		
IC1901	D-5	C
Test Points		
TL1901	F-5	C
TL1902	E-5	C
TL1903	E-5	C
TL1904	F-5	C
TL1905	A-7	F
Connectors		
FP1901	F-7	F
FP1903	D-7	F
P1902	A-7	F

ADDRESS INFORMATION
C…COMPONENT SIDE
F…FOIL SIDE

DVD-LS90PP/93P
OPERATION P.C.B. (REP3885A-S)
& INVERTER P.C.B. (REP3894A-S)



DVD-LS90PP/LS93P
INTERCONNECTION
SCHEMATIC DIAGRAM

AUDIO SIGNAL

G

DGND
ØPR+5V
POWERMUT
HPMUT-H
AMUT
DD+3R3V
M+5R5V
AAGND
PWR+9V
PØN-H
DCVØL
HPSENSE-H
P+3R3V
IECØUT
HPJØPEN-H
VGND
STBDAC
SBT3
SB03
DACSCK
DMIXØUT
SRCK
LRCK
SPL-
SPL+
SPR+
SPR-

IC4003 COZBZ0001010 (AUDIO POWER AMP)
IC4009 COCBCDC00008 (REG)
IC4001 COFBBK000049 (AUDIO DAC)
IC4002 COABBB000105 (NJM2115V-TE1) (AMP)

JK4003 K2HC105B0009 HEAD PHONES
JK4002 K2HC105B0009 HEAD PHONES
JK4001 K2HC108B0002 OPT OUT / AUDIO OUT

QR4004 XP0121300L (MUTE)
QR4009 XP0121300L (MUTE)
QR4005 XP0121300L
QR4013 B1GFGCAA0001 (MUTE)
QR4012 B1GFGCAA0001 (MUTE)
QR4011 B1GFGCAA0001 (MUTE)
QR4007 B1GDCFJN0011 (MUTE)
QR4003 B1GDCFJN0011 (MUTE)
QR4006 B1GDCFJN0011 (MUTE)
QR4002 B1GDCFJN0011 (SWITCHING)
QR4001 UNR521300L (SWITCHING)
QR4008 UNR521300L (MUTE)
Q4001 2SD1819A0L (SWITCHING)
Q4002 2SD1819A0L (JACK-IN DET)

D4003 MA3S132D0L
D4001 MA3S132D0L
D4006 MA2S111Ø0L
D4009 MA2S111Ø0L
D4005 MA2S024Ø0L

LB4013 JØJBC0000028
LB4010 JØJBC0000028
LB4014 JØJBC0000028
LB4011 JØJBC0000028
LB4003 JØJBC0000028
LB4007 JØJBC0000028
LB4051 JØJBC0000028
LB4004 JØJBC0000028
LB4006 JØJBC0000028
LB4005 JØJBC0000028
LB4001 G1C220MØØØ12
LB4002 G1C220MØØØ12
L4001 JØJBC0000028
L4006 JØJBC0000028
L4002 G1C220KA0055
L4004 JØJCC0000101

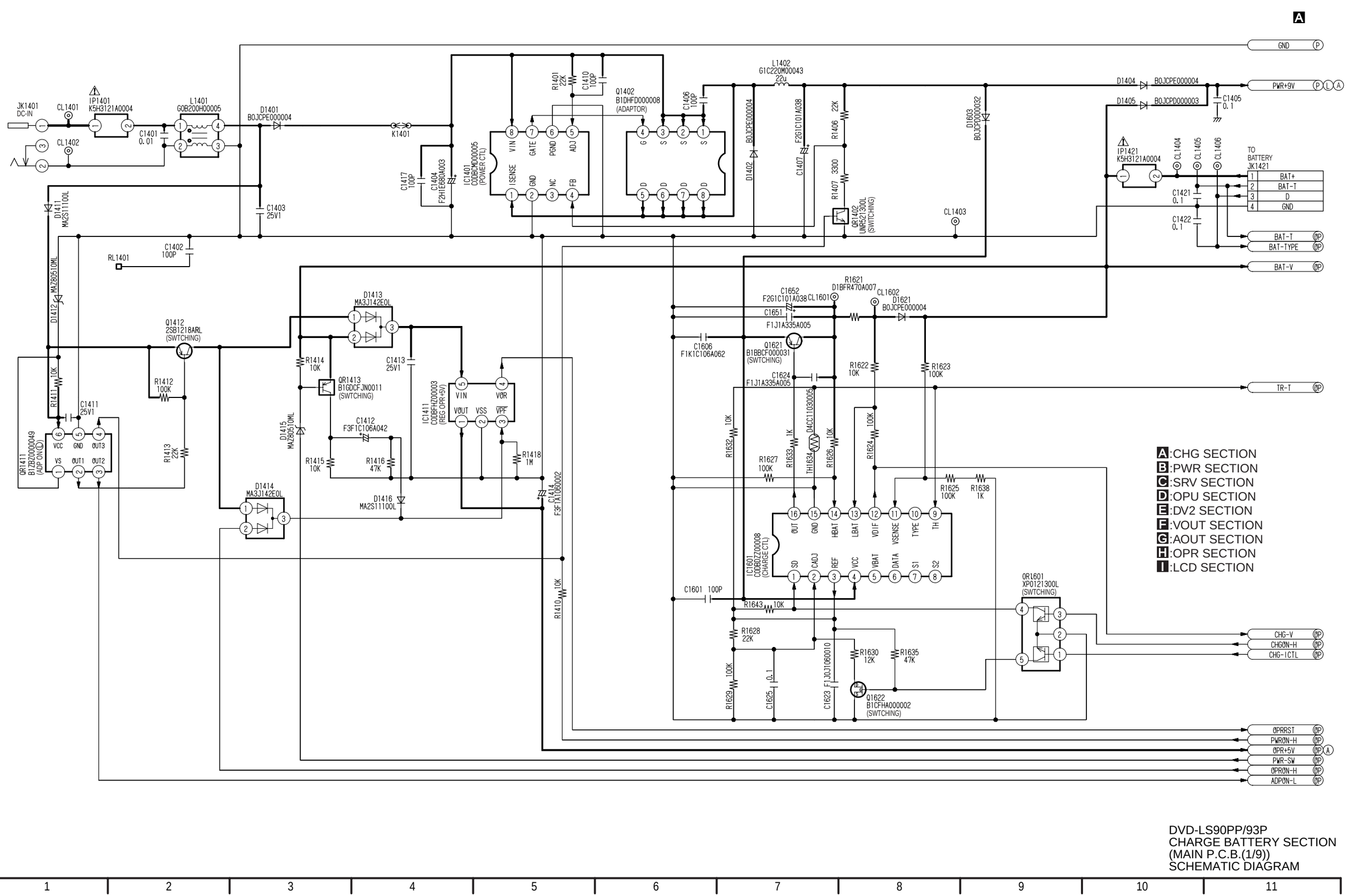
CL4001 CL4002 CL4003 CL4004 CL4005 CL4006 CL4007 CL4008 CL4009 CL4010 CL4011 CL4012 CL4013 CL4014 CL4015 CL4016 CL4017 CL4018 CL4019 CL4020 CL4021 CL4022 CL4023 CL4024 CL4025 CL4026 CL4027

C4030 F3F1A226A008
C4020 F3F0J476M003
C4032 1
C4061 F3F1A106ØØØ2
C4054 F3F1A106ØØØ2
C4053 F3F1A106ØØØ2
C4038 0.1
C4037 0.1
C4012 F2G0G331A012
C4011 F2G0G331A012
C4025 0.1
C4027 0.1
C4021 F3F1A226A008
C4024 0.1
C4023 F3F0J476M003
C4026 0.1
C4001 F1J0J1060010
C4002 F1J0J1060010
C4005 F1J0J1060010
C4006 F1J0J1060010
C4036 F1J0J1060010
C4031 1
C4067 F1K1C106A062
C4017 F2G1C101A038
C4018 F3F0J476M003
C4010 0.47
C4009 0.47
C4003 39P
C4004 39P
C4015 0.1
C4041 ECJ1VB1H103K
C4042 ECJ1VB1H103K
C4013 ECJ1VB1H103K
C4014 ECJ1VB1H103K
C4028 1000P
C4007 1000P
C4008 1000P
C4019 0.1
C4505 1000P
C4506 0.1

R4045 10K
R4044 22K
R4034 10K
R4036 5.6K
R4038 10K
R4018 15K
R4037 10K
R4035 5.6K
R4017 15K
R4046 22K
R4047 33K
R4033 10K
R4043 33K
R4006 10
R4016 56K
R4020 10K
R4057 1
R4019 10K
R4015 56K
R4005 10
R4063 27
R4065 1500
R4066 1500
R4064 27
R4067 4700
R4068 4700
R4021 27
R4023 1500
R4024 1500
R4022 27
R4025 4700
R4026 4700
R4031 2200
R4030 47K
R4032 1000
R4039 100K
R4040 0
R4069 47K
R4001 27K
R4002 27K
R4041 820
R4042 820
R4003 33K
R4004 33K
R4009 47K
R4010 47K
R4011 100
R4012 100
R4014 3300
R4013 3300
R4007 100K
R4008 1K
R4027 22K
R4028 22K

A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION

DVD-LS90PP/93P
AUDIO OUT SECTION
(MAIN P.C.B.(7/9))
SCHEMATIC DIAGRAM


A
GND
PWR+9V
BAT-T
BAT-TYPE
BAT-V
TR-T
CHG-V
CHGØN-H
CHG-ICTL
ØPRRST
PWRØN-H
ØPR+5V
PWR-SW
ØPRØN-H
ADPØN-L
TO BATTERY JK1421
BAT+
BAT-T
D
GND
JK1401 DC-IN
CL1401
CL1402
IP1401 K5H3121A0004
L1401 G0B200H00005
C1401 0.01
D1401 B0JCPE000004
K1401
C1403 25V1
C1402 100P
RL1401
D1411 MA2S111OOL
D1412 MAZ8051OML
Q1412 2SB1218ARL (SWTCHING)
R1411 10K
R1412 100K
R1413 22K
C1411 25V1
QR1411 B1ZBZ0000049 (ADP ON)
VCC GND ØUT3 VS ØUT1 ØUT2
D1413 MA3J142E0L
R1414 10K
C1413 25V1
QR1413 B1GDCFJN0011 (SWTCHING)
C1412 F3F1C106A042
R1415 10K
R1416 47K
D1414 MA3J142E0L
D1415 MAZ8051OML
D1416 MA2S111OOL
IC1411 C0BBFHZ00003 (REG OPR+5V)
VIN VØR VØUT VSS VPF
R1418 1M
C1414 F3F1A1060002
R1410 10K
R1401 22K
C1410 100P
C1417 100P
C1404 F2H1E680A003
IC1401 C0BBCMD00005 (POWER CTL)
ISENSE VIN GATE GND PGND NC ADJ FB
Q1402 B1DHFD000008 (ADAPTOR)
G S S S D D D D
C1406 100P
D1402 B0JCPE000004
L1402 G1C220M00043 22u
C1407 F2G1C101A038
R1406 22K
R1407 3300
QR1402 UNR521300L (SWITCHING)
D1603 B0JCPD000032
CL1403
D1404 B0JCPE000004
D1405 B0JCPD000003
C1405 0.1
IP1421 K5H3121A0004
CL1404
CL1405
CL1406
C1421 0.1
C1422 0.1
C1652 F2G1C101A038
CL1601
C1651 F1J1A335A005
C1606 F1K1C106A062
R1621 D1BFR470A007
CL1602
D1621 B0JCPE000004
Q1621 B1BBCF000031 (SWTCHING)
C1624 F1J1A335A005
R1622 10K
R1623 100K
R1632 10K
R1633 1K
TH1634 D4CC11030005
R1626 10K
R1624 100K
R1627 100K
R1625 100K
R1638 1K
IC1601 C0BBDZZ00008 (CHARGE CTL)
ØUT GND HBAT LBAT VDIF VSENSE TYPE TH
SD CADJ REF VCC VBAT DATA S1 S2
C1601 100P
R1643 10K
R1628 22K
R1629 100K
C1625 0.1
C1623 F1J0J1060010
R1630 12K
R1635 47K
Q1622 B1CFHA000002 (SWTCHING)
ØR1601 XP0121300L (SWTCHING)
A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION
DVD-LS90PP/93P
CHARGE BATTERY SECTION
(MAIN P.C.B.(1/9))
SCHEMATIC DIAGRAM

A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION

VIDEO SIGNAL
AUDIO SIGNAL
RF SIGNAL

E

IC6301 RPKWPS81Z160 (16M FLASH ROM)
IC3051 C3HBPD0000133 (SDRAM)
IC3001 MN2DS03VP1H (DV2.1)
IC6351 C3EBFC0000042 C3EBFC0000047 (EEPROM)
RX6351 D1H84724A024
RX3001 D1H81034A024
RX3007 D1H81034A024
IC6201 C0EBEE0000384 (RESET)
RX3003 D1H84724A024
FP3031 (FOR FLASH ROM WRITING)

DVD-LS90PP/93P
DV2 SECTION (MAIN P.C.B.(5/9)) SCHEMATIC DIAGRAM

VIDEO SIGNAL

TO
LCD PANEL
FP1903

VCOM	30
STH1	29
VB	28
RED	27
GREEN	26
BLUE	25
OEH	24
VDD	23
MODE	22
CLK1	21
CLK2	20
CLK3	19
RL	18
NC(STH2)	17
VEE	16
GND	15
VCOM	14
STV2	13
OEV3	12
OEV2	11
OEV1	10
CPV	9
GND(UD)	8
NC(STV1)	7
NC	6
VSS	5
GND	4
VDD	3
NC	2
VGON	1

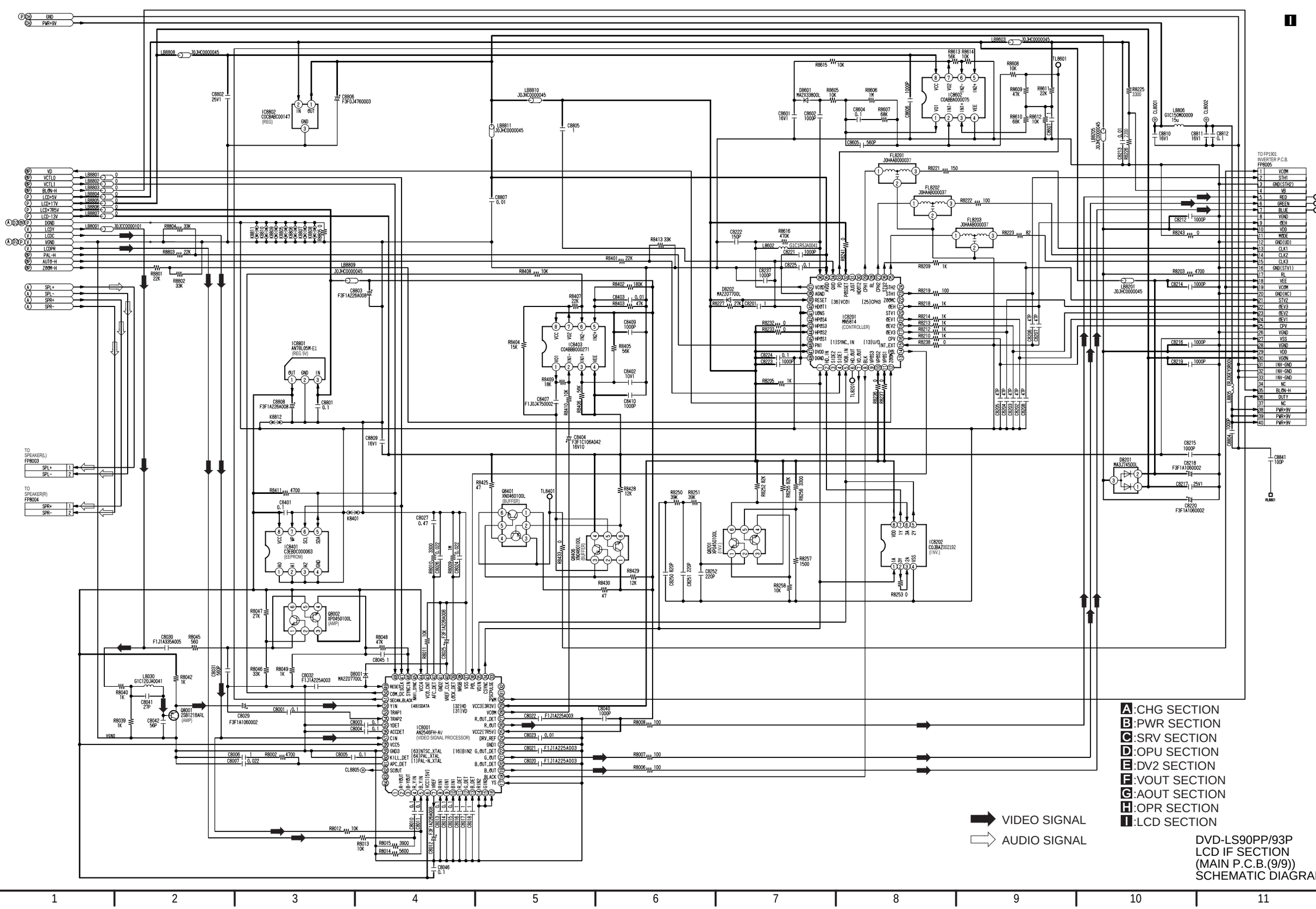
TO FP8005
MAIN P.C.B.
FP1901

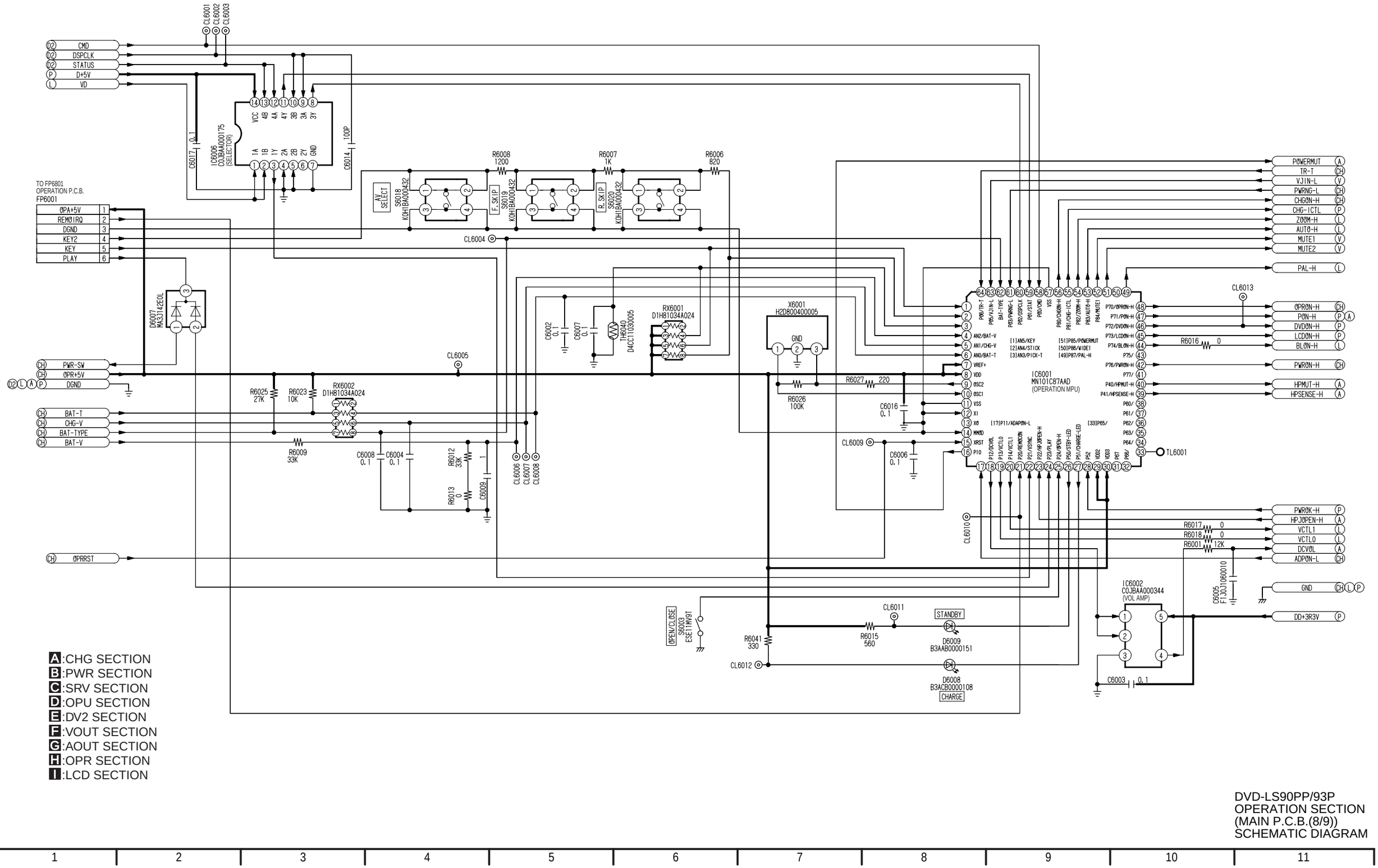
VCOM	40
STH1	39
GND(STH2)	38
VB	37
RED	36
GREEN	35
BLUE	34
GND	33
OEH	32
VDD	31
MODE	30
GND(UD)	29
CLK1	28
CLK2	27
CLK3	26
GND(STV1)	25
RL	24
VEE	23
VCOM	22
GND(NC)	21
STV2	20
OEV3	19
OEV2	18
OEV1	17
CPV	16
GND	15
VSS	14
GND	13
VDD	12
VGON	11
INV-GND	10
INV-GND	9
INV-GND	8
NC	7
BLON-H	6
DUTY	5
NC	4
PWR+9V	3
PWR+9V	2
PWR+9V	1

TL1901
IP1901
K5H2021A0003
L1901 15μH
G1C150Z00004
C1917
F1J1C4750003
IC1901
CODBZKA00003
(INV.CTL)
R1915
22
C1915
F1J1C4750003
Q1901
B1DFDF000001
(INV.)
T1901
ETJV15ZE1KAB
TL1903
R1912
220
C1910 16V1
R1911 39K
C1905 0.068
C1906 100P
R1901 56K
R1919 270K
R1902 62K
C1907 0.68
C1908 2200P
C1909 3300P
R1903 100K
R1904 100K
R1905 1K
TL1904
TL1902
R1913 0
R1914 0
C1912 0.1
C1913 0.1
R1917 56K
C1911 2200P
C1914 2200P
C1902 0.068
R1916 3.9K
C1903 F1L3F2200004
C1904 0.01
R1908 220K
R1907 330K
D1901 MA3S13300L
R1909 12K
R1910 470
D1902 MA3S13300L
D1903 MA3S13200L
TL1905
TO BACK LIGHT
PANEL
P1902

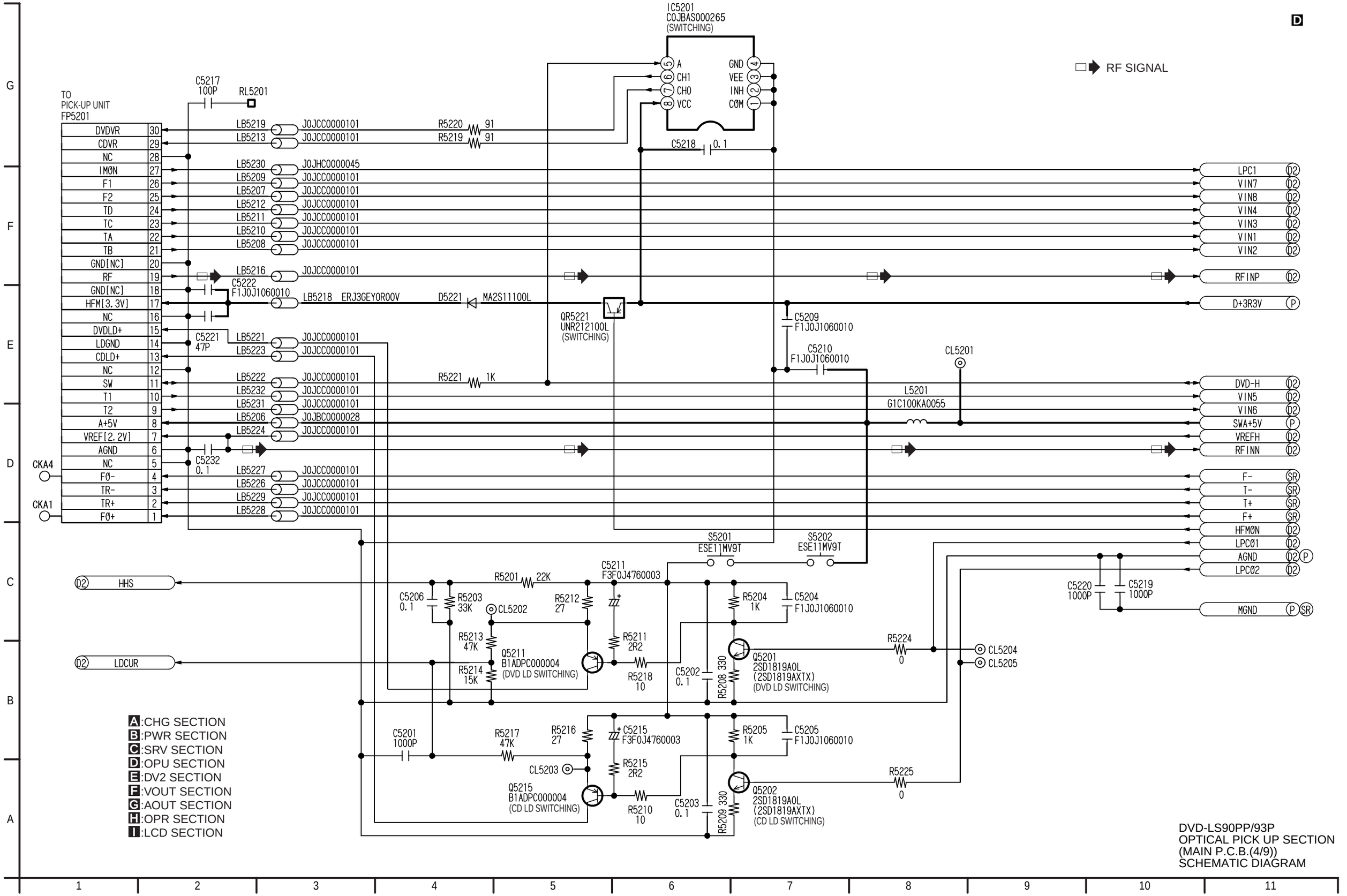
1	HI
2	LOW

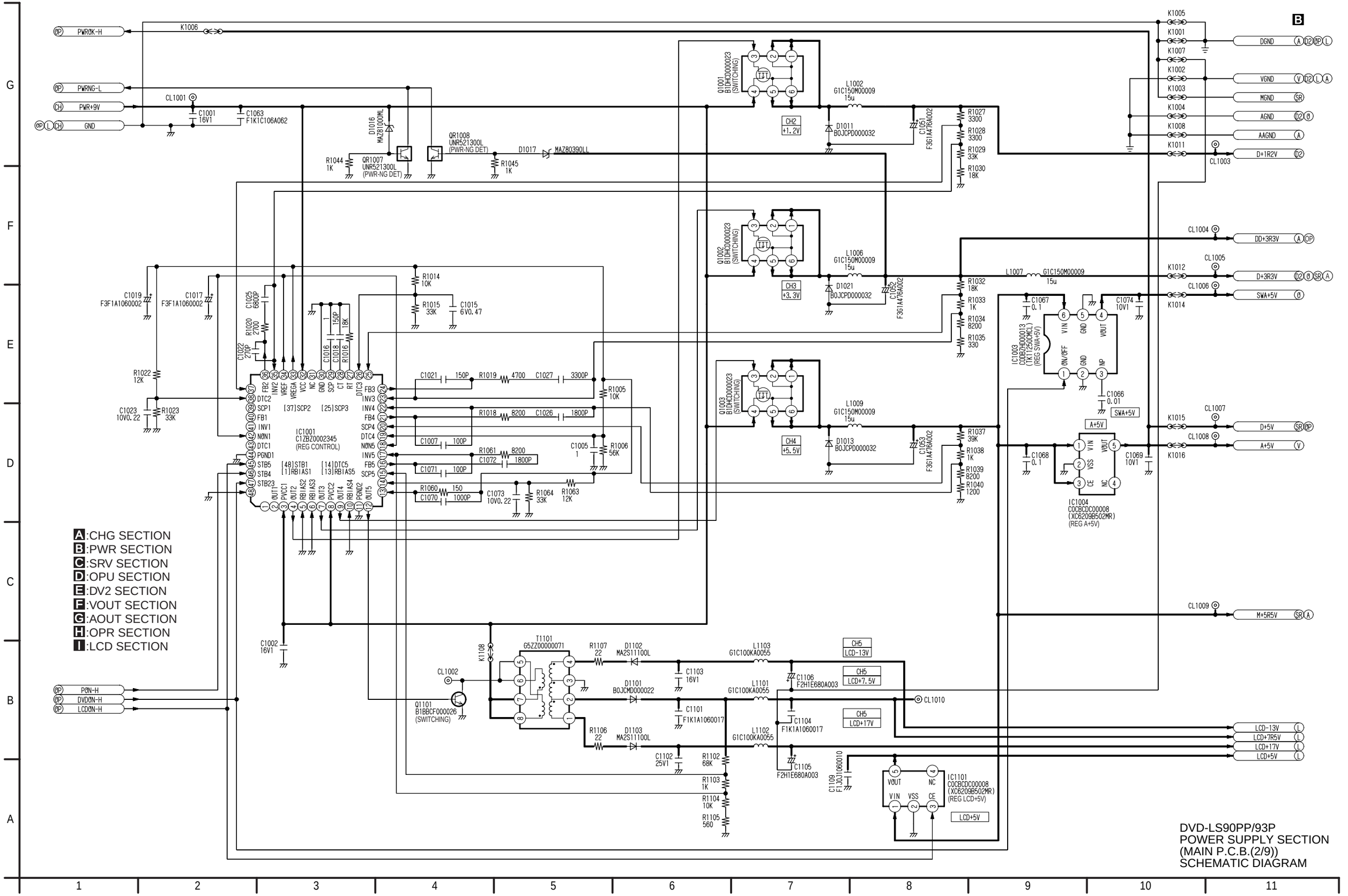
DVD-LS90PP/93P
INVERTER P.C.B.
SCHEMATIC DIAGRAM


GND
PWR+9V
VD
VCTL0
VCTL1
BLON-H
LCD+5V
LCD+17V
LCD+7R5V
LCD-13V
DGND
LCDY
LCDC
VGND
LCDPR
PAL-H
AUTO-H
ZOOM-H
SPL+
SPL-
SPR+
SPR-
TO SPEAKER(L) FPB003
TO SPEAKER(R) FPB004
IC8802 C0CBABC00147 (REG)
IC8801 AN78L05M-E1 (REG 5V)
IC8401 C5EB0C000063 (EEPROM)
IC8001 AN2548FH-AV (VIDEO SIGNAL PROCESSOR)
IC8403 C0ABBB000271
IC8201 MN5814 (CONTROLLER)
IC8602 C0ABBA000075
IC8202 C0JBAZ002192 (I NV.)
Q8001 2SB1218ARL (AMP)
Q8002 XP04501 00L (AMP)
Q8401 XN0460100L (BUFFER)
Q8406 XN0460100L (BUFFER)
Q8201 XP0450100L (I NV)
D8001 MAZ2077000L
D8201 MA3J74500L
D8202 MA2Z077 00L
D8601 MA2X338 00L
TO FP1901 INVERTER P.C.B. FPB005
TL8601
TL8602
TL8603
TL8604
TL8201
TL8401
TL8801
TL8820
A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION
VIDEO SIGNAL
AUDIO SIGNAL
DVD-LS90PP/93P
LCD IF SECTION
(MAIN P.C.B.(9/9))
SCHEMATIC DIAGRAM



DVD-LS90PP/93P
OPERATION SECTION
(MAIN P.C.B.(8/9))
SCHEMATIC DIAGRAM


RF SIGNAL
IC5201
C0JBAS000265
(SWITCHING)
A
CH1
CH0
VCC
GND
VEE
INH
C0M
TO
PICK-UP UNIT
FP5201
DVDVR 30
CDVR 29
NC 28
IM0N 27
F1 26
F2 25
TD 24
TC 23
TA 22
TB 21
GND[NC] 20
RF 19
GND[NC] 18
HFM[3.3V] 17
NC 16
DVDLD+ 15
LDGND 14
CDLD+ 13
NC 12
SW 11
T1 10
T2 9
A+5V 8
VREF[2.2V] 7
AGND 6
NC 5
F0- 4
TR- 3
TR+ 2
F0+ 1
CKA4
CKA1
C5217 100P
RL5201
C5232 0.1
C5221 47P
C5222 F1J0J1060010
LB5219 J0JCC0000101
LB5213 J0JCC0000101
LB5230 J0JHC0000045
LB5209 J0JCC0000101
LB5207 J0JCC0000101
LB5212 J0JCC0000101
LB5211 J0JCC0000101
LB5210 J0JCC0000101
LB5208 J0JCC0000101
LB5216 J0JCC0000101
LB5218 ERJ3GEY0R00V
LB5221 J0JCC0000101
LB5223 J0JCC0000101
LB5222 J0JCC0000101
LB5232 J0JCC0000101
LB5231 J0JCC0000101
LB5206 J0JBC0000028
LB5224 J0JCC0000101
LB5227 J0JCC0000101
LB5226 J0JCC0000101
LB5229 J0JCC0000101
LB5228 J0JCC0000101
R5220 91
R5219 91
R5221 1K
D5221 MA2S1110OL
QR5221
UNR212100L
(SWITCHING)
C5218 0.1
C5209 F1J0J1060010
C5210 F1J0J1060010
CL5201
L5201
G1C100KA0055
LPC1
VIN7
VIN8
VIN4
VIN3
VIN1
VIN2
RFINP
D+3R3V
DVD-H
VIN5
VIN6
SWA+5V
VREFH
RFINN
F-
T-
T+
F+
HFM0N
LPC01
AGND
LPC02
MGND
S5201 ESE11MV9T
S5202 ESE11MV9T
C5220 1000P
C5219 1000P
HHS
LDCUR
C5211 F3F0J4760003
R5201 22K
C5206 0.1
R5203 33K
CL5202
R5212 27
R5213 47K
R5214 15K
Q5211
B1ADPC000004
(DVD LD SWITCHING)
R5211 2R2
R5218 10
C5202 0.1
R5208 330
R5204 1K
C5204 F1J0J1060010
Q5201
2SD1819A0L
(2SD1819AXTX)
(DVD LD SWITCHING)
R5224 0
CL5204
CL5205
C5201 1000P
R5217 47K
R5216 27
C5215 F3F0J4760003
CL5203
R5215 2R2
Q5215
B1ADPC000004
(CD LD SWITCHING)
R5210 10
C5203 0.1
R5209 330
R5205 1K
C5205 F1J0J1060010
Q5202
2SD1819A0L
(2SD1819AXTX)
(CD LD SWITCHING)
R5225 0
A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION
DVD-LS90PP/93P
OPTICAL PICK UP SECTION
(MAIN P.C.B.(4/9))
SCHEMATIC DIAGRAM


PWROK-H
PWRNG-L
PWR+9V
GND
K1006
CL1001
C1001 16V1
C1063 F1K1C106A062
D1016 MAZ81000ML
R1044 1K
QR1007 UNR521300L (PWR-NG DET)
QR1008 UNR521300L (PWR-NG DET)
D1017 MAZ80390LL
R1045 1K
Q1001 B1DHCD000023 (SWITCHING)
CH2 +1.2V
L1002 G1C150M00009 15u
D1011 BOJCPD000032
C1051 F3G1A476A002
R1027 3300
R1028 3300
R1029 33K
R1030 18K
K1005
K1001
K1007
K1002
K1003
K1004
K1008
K1011
DGND
VGND
MGND
AGND
AAGND
D+1R2V
CL1003
Q1002 B1DHCD000023 (SWITCHING)
CH3 +3.3V
L1006 G1C150M00009 15u
D1021 BOJCPD000032
C1052 F3G1A476A002
L1007 G1C150M00009 15u
R1032 18K
R1033 1K
R1034 8200
R1035 330
CL1004
DD+3R3V
CL1005
K1012
D+3R3V
CL1006
SWA+5V
K1014
Q1003 B1DHCD000023 (SWITCHING)
CH4 +5.5V
L1009 G1C150M00009 15u
D1013 BOJCPD000032
C1053 F3G1A476A002
R1037 39K
R1038 1K
R1039 8200
R1040 1200
C1067 0.1
C1074 10V1
IC1003 C0DBZH000013 (TK71250MCL) (REG SWA+5V)
VIN GND VOUT ON/OFF GND NP
C1066 0.01
SWA+5V
A+5V
C1068 0.1
C1069 10V1
IC1004 C0CBCDC00008 (XC6209B502MR) (REG A+5V)
VIN VOUT VSS CE NC
CL1007
K1015
D+5V
CL1008
A+5V
K1016
C1019 F3F1A1060002
C1017 F3F1A1060002
C1025 6800P
R1020 2700
C1022 270P
C1016 150P
C1018 18K
R1016 1
R1014 10K
R1015 33K
C1015 6V0.47
R1022 12K
C1023 10V0.22
R1023 33K
IC1001 C1ZBZ0002345 (REG CONTROL)
FB2 INV2 VREF VREGA VCC NC GND SCP CT RT DTC3
DTC2 SCP1 FB1 INV1 NON1 DTC1 PGND1 STB5 STB4 STB23
[37]SCP2 [25]SCP3 [48]STB1 [1]RB1AS1 [14]DTC5 [13]RB1AS5
OUT1 PVCC1 OUT2 RB1AS2 RB1AS3 OUT3 PVCC2 OUT4 RB1AS4 PGND2 OUT5
FB3 INV3 INV4 FB4 SCP4 DTC4 NON5 INV5 FB5 SCP5
C1021 150P
R1019 4700
C1027 3300P
R1005 10K
R1018 8200
C1026 1800P
C1007 100P
C1071 100P
C1005 1
R1006 56K
R1061 8200
C1072 1800P
R1060 150
C1070 1000P
C1073 10V0.22
R1064 33K
R1063 12K
C1002 16V1
K1108
T1101 G5ZZ00000071
R1107 22
D1102 MA2S111OOL
D1101 B0JCMD000022
D1103 MA2S111OOL
R1106 22
C1103 16V1
C1101 F1K1A1060017
C1102 25V1
L1103 G1C100KA0055
L1101 G1C100KA0055
L1102 G1C100KA0055
C1106 F2H1E680A003
C1104 F1K1A1060017
C1105 F2H1E680A003
CH5 LCD-13V
CH5 LCD+7.5V
CH5 LCD+17V
CL1002
Q1101 B1BBCF000026 (SWITCHING)
CL1010
R1102 68K
R1103 1K
R1104 10K
R1105 560
C1109 F1J0J1060010
IC1101 C0CBCDC00008 (XC6209B502MR) (REG LCD+5V)
VOUT NC VIN VSS CE
LCD+5V
CL1009
M+5R5V
LCD-13V
LCD+7R5V
LCD+17V
LCD+5V
P0N-H
DVD0N-H
LCD0N-H
A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION
DVD-LS90PP/93P
POWER SUPPLY SECTION
(MAIN P.C.B.(2/9))
SCHEMATIC DIAGRAM

C

D+5V
D+3R3V
VHALF
TRVDRV
ACTMUT-L
TRDRV
FODRV
MGND
F-
F+
T-
T+
M+5R5V
TRV-SW+

R2523 47K

TO TRAVERSE MECHANISM UNIT FP2501

DC1	1
DC2	2
SW1	3
SW2	4
VCC	5
VH	6
H2-	7
H2+	8
H3-	9
H3+	10
H1-	11
H1+	12
A2	13
A2	14
A3	15
A3	16
A1	17
A1	18

RX2651 D1H81034A024

C2601 F3G1A476A002
C2602 0.1
C2603 F3G1A476A002
C2604 0.1
C2605 F3G1A476A002
C2606 0.1
C2607 0.1

IC2601 C06BG0000048 (BA6838FM-E2) (TRAVERSE MOTOR DRIVE)
28 LDCNT, 27 MUTE3, 26 TRIN, 25 BIAS2, 24 LDIN, 23 VIN3, 22 PREVCC, 30 FIN, 21 VCC (CH1, 2) (CH3, 4), 20 MUTE4, 19 GND (CH3, 4), 18 VO3-, 17 VO3+, 16 VO4-, 15 VO4+
1 BIAS1, 2 VIN1, 3 VIN2, 4 OPIN+, 5 OPIN-, 6 OPOUT, 7 GND (PRE), 29 FIN, 8 VCC (CH1, 2) (CH3, 4), 9 MUTE12, 10 GND (CH1, 2) (CH3, 4), 11 VO2-, 12 VO2+, 13 VO1-, 14 VO1+

C2501 100P
R2501 470

CL2654 CL2655
HFG
SS
SPDRV
R2653 15K

R2652 ERJ12RQJR68U
C2651 F3G1A476A002
C2652 F3F0J476M003
C2653 0.1
C2654 0.1
C2656 0.1
C2657 0.1
C2661 0.1
CL2651
CL2652

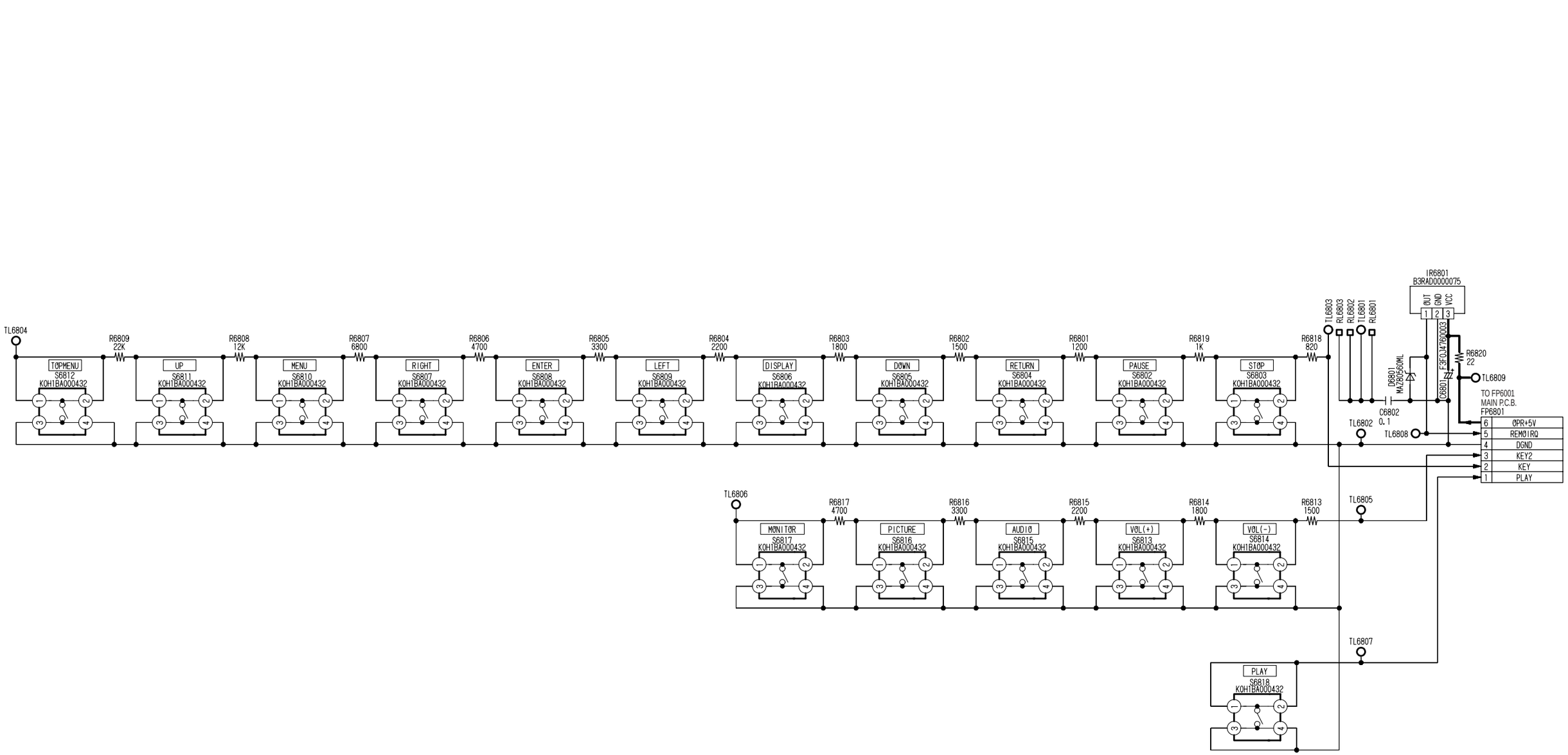
IC2651 C06BF0000004 (BA6679FM-E2) (SPINDLE MOTOR DRIVE)
28 RNF, 27 VM, 26 GSW, 25 VCC, 24 FG, 23 PS, 22 EC, 30 FIN, 21 ECR, 20 FR, 19 FG2, 18 SB, 17 CNF, 16 BR, 15 VH
1 NC, 2 A3, 3 NC, 4 A2, 5 NC, 6 NC, 7 A1, 29 FIN, 8 GND, 9 H1+, 10 H1-, 11 H2+, 12 H2-, 13 H3+, 14 H3-

R2651 470

CL2653
C2655 0.1
C2658 0.01
C2659 0.01
C2660 0.01
C2662 0.01
C2663 0.01
C2664 0.01

A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION

DVD-LS90PP/93P
SERVO SECTION
(MAIN P.C.B.(3/9))
SCHEMATIC DIAGRAM



DVD-LS90PP/93P
OPERATION P.C.B.
SCHEMATIC DIAGRAM

F

VIDEO SIGNAL

IC3201
C9ZB00000461
(VIDEO DRIVE)

D2 VCOUT
D2 MUTE1
P A+5V
D2 VYOUT
A D2 P L VGND
D2 Ø AGND
D2 PYOUT
D2 PBOUT
D2 MUTE2
D2 PROUT
L LCDY
L LCDC
L LCDPR

C3202 0.01
C3201 1
C3226 1
C3233 1
C3212 1
C3203 0.1
C3221 0.1
C3215 F3F0J4760003
C3222 F3F0J226A004
C3241 1000P
C3242 1000P
C3243 1000P
C3214 1000P
R3233 22K
R3232 22K
L3204 G1C220KA0055

1 VCC1
2 S1
3 S2
4 CIN
5 MUTE1
6 CVIN
7 SEL (CV/MIX)
8 YIN
9 BIAS
10 SEL(BIAS/CLAMP)
11 PY/GIN
12 GND
13 PB/BIN
14 MUTE2
15 PR/RIN
16 VCC2
17 PR/ROUTSAG
18 PR/ROUT
19 GND
20 PB/BOUTSAG
21 PB/BOUT
22 GND
23 PY/GOUTSAG
24 PY/GOUT
25 GND
26 YOUTSAG
27 YOUT
28 GND
29 CVOUTSAG
30 CVOUT
31 S-DCOUT
32 COUT

TL3202
TL3201
TL3231
TL3261
TL3251

C3204 F2G0G331A012
C3210 F3F0J226A004
C3237 F2H0G221A001
CL3201
CL3203
R3203 75
LB3203 J0JCC0000101
CL3204
CL3205
CL3206
CL3207
CL3208
R3205 1K
VJIN-L (Ø P)
JK3201 K2HC104B0027
VIDEO OUT
RL3201

L3254 G1C220KA0055
L3253 G1C220KA0055
L3252 G1C220KA0055
L3251 G1C220KA0055
R3251 680
C3257 47P
C3255 47P
C3253 47P
C3251 47P
C3258 47P
C3256 47P
C3254 47P
C3252 47P

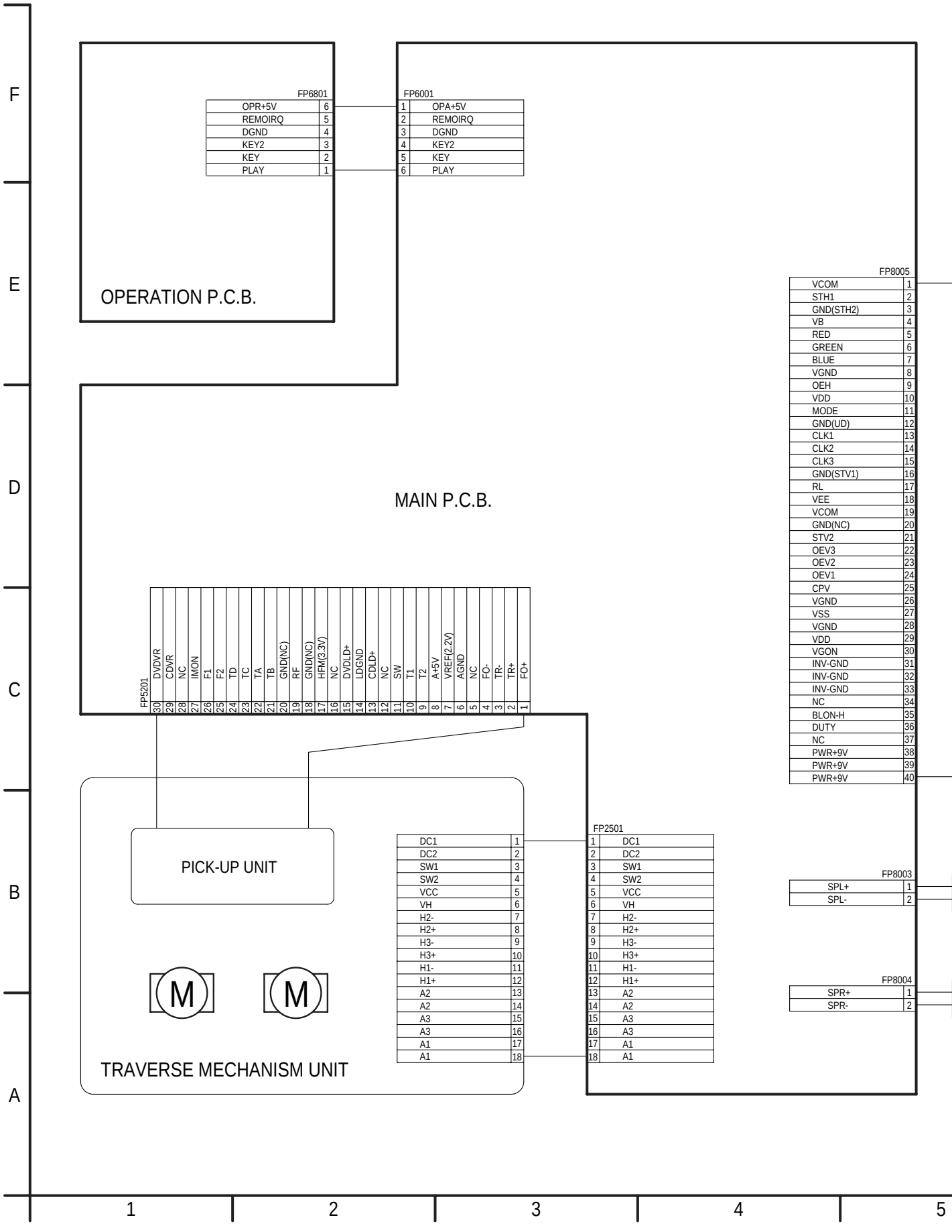
L3264 G1C220KA0055
L3263 G1C220KA0055
L3262 G1C220KA0055
L3261 G1C220KA0055
R3261 680
C3267 47P
C3265 47P
C3263 47P
C3261 47P
C3268 47P
C3266 47P
C3264 47P
C3262 47P

A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION

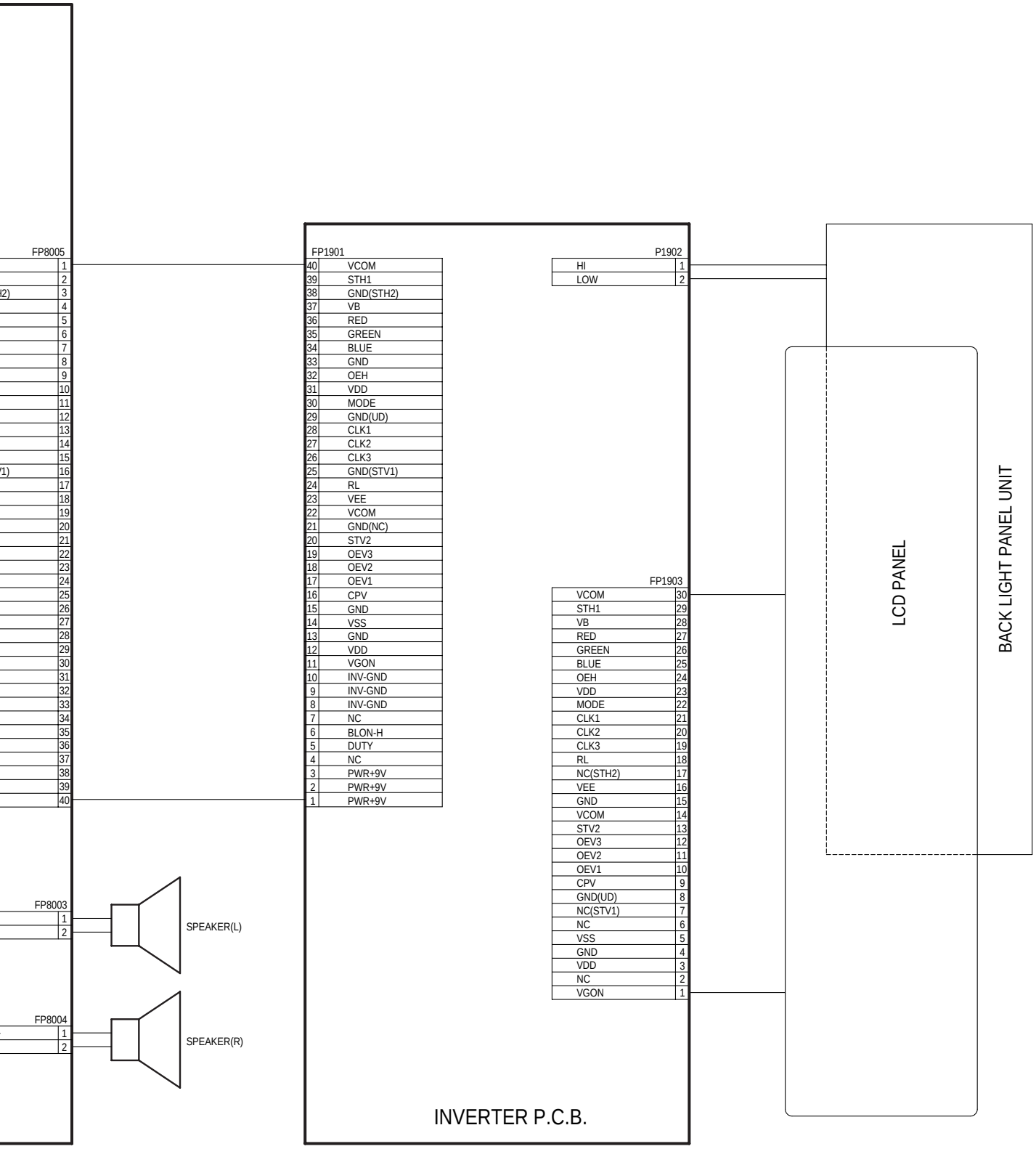
DVD-LS90PP/93P
VIDEO OUT SECTION
(MAIN P.C.B.(6/9))
SCHEMATIC DIAGRAM

15 INTERCONNECTION SCHEMATIC DIAGRAM & SCHEMATIC D

15.1. INTERCONNECTION SCHEMATIC DIAGRAM



MATIC DIAGRAM NOTES



DVD-LS90PP/LS93P
INTERCONNECTION
SCHEMATIC DIAGRAM

5 | 6 | 7 | 8 | 9

15.2. SCHEMATIC DIAGRAM NOTES

This schematic diagram may be modified at any time with the development of new technology.

Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

Furthermore, special parts which have purpose of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacture´s specified parts shown in theparts list.

Important safety notice:

There are special components used in this equipment which are important for safety.

These parts are marked by ⚠ in the schematic diagrams. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

Caution!

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

Cover the parts boxes made of plastics with aluminum foil.

Ground the soldering iron.

Put a conductive mat on the work table.

Do not touch the legs of IC or LSI with the fingers directly.

CAUTION : FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE **F1, F3, F4 8A 125V FUSE, F5 1.6A 125V FUSE. F6 4A 125V FUSE.**

RISK OF FIRE-REPLACE FUSE AS MARKED.

FUSE CAUTION

These symbols located near the fuse indicates that the fuse used is a fast operating type. For continued protection against fire harzard, replace with the same type fuse. For fuse rating, refer to the marking adjacent to the symbol.

Ce symbole indique que le fusible utilisé est à rapide. Pour une protection permanente, n' utiliser que des fusibles de même type. Ce dernier est indiqué là qù le présent symbole est apposé.

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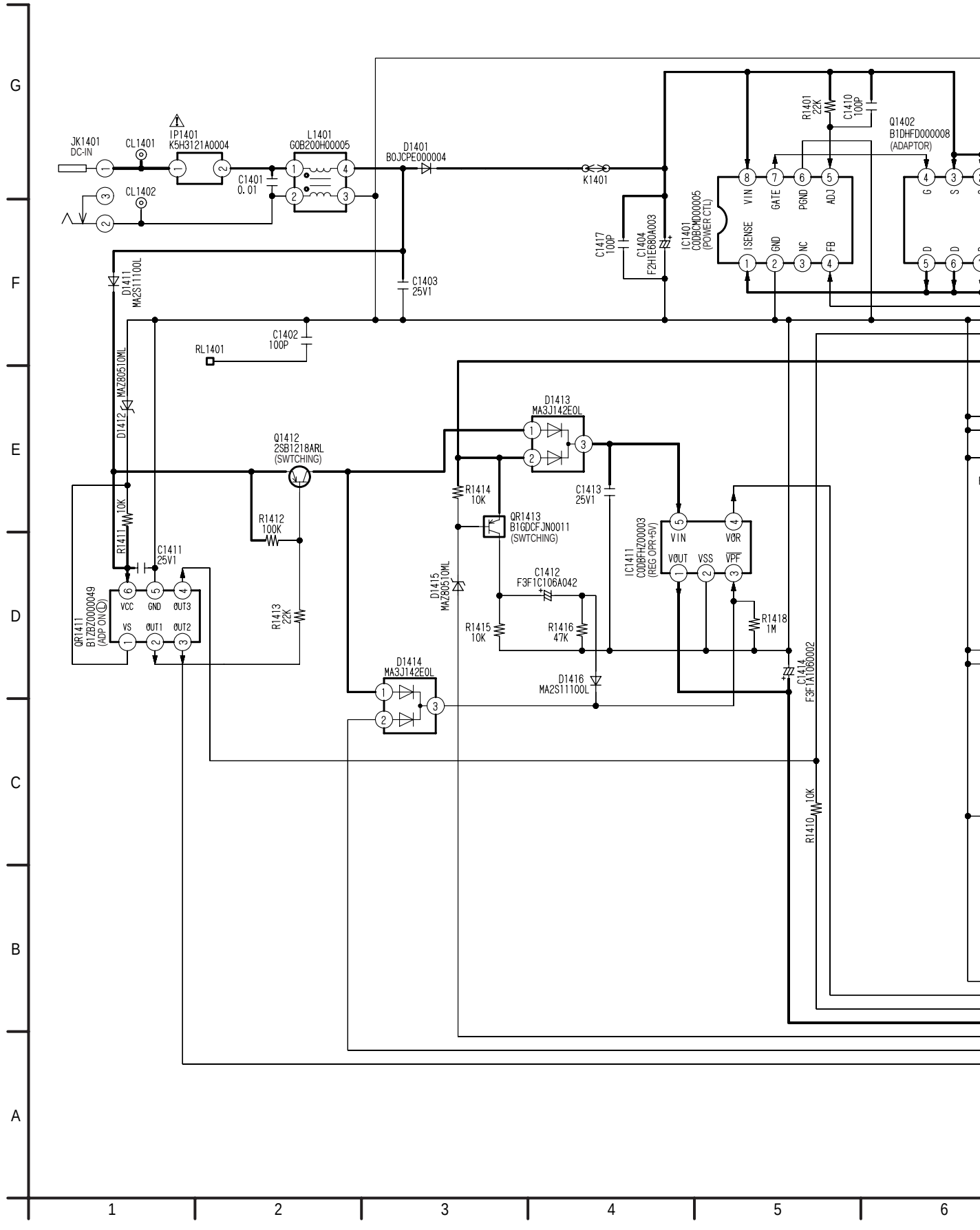
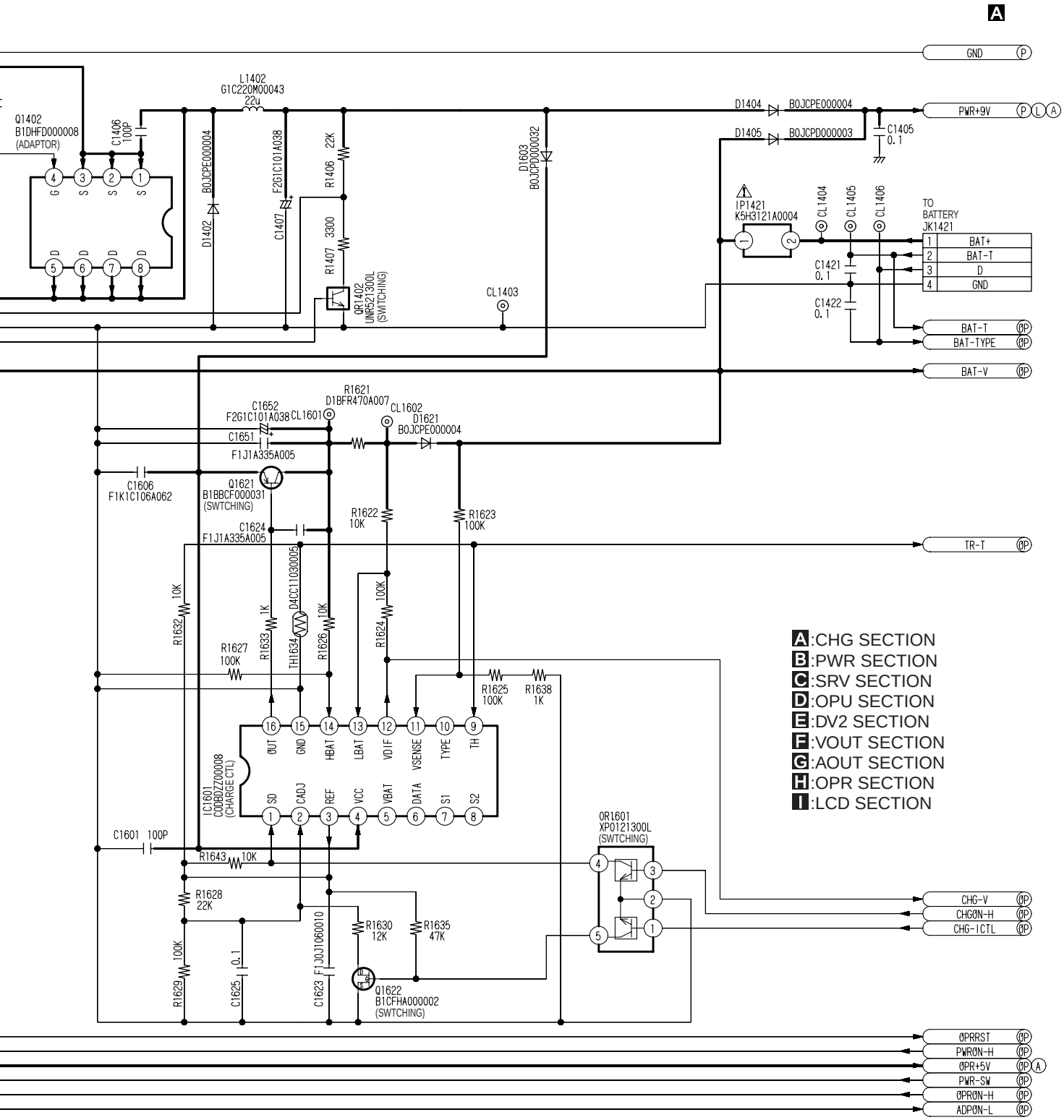
of

16 SCHEMATIC DIAGRAM

16.1. CHARGE BATTERY SECTION (MAIN P.C.B. (1/9)) SCHEMATIC DIAGRAM



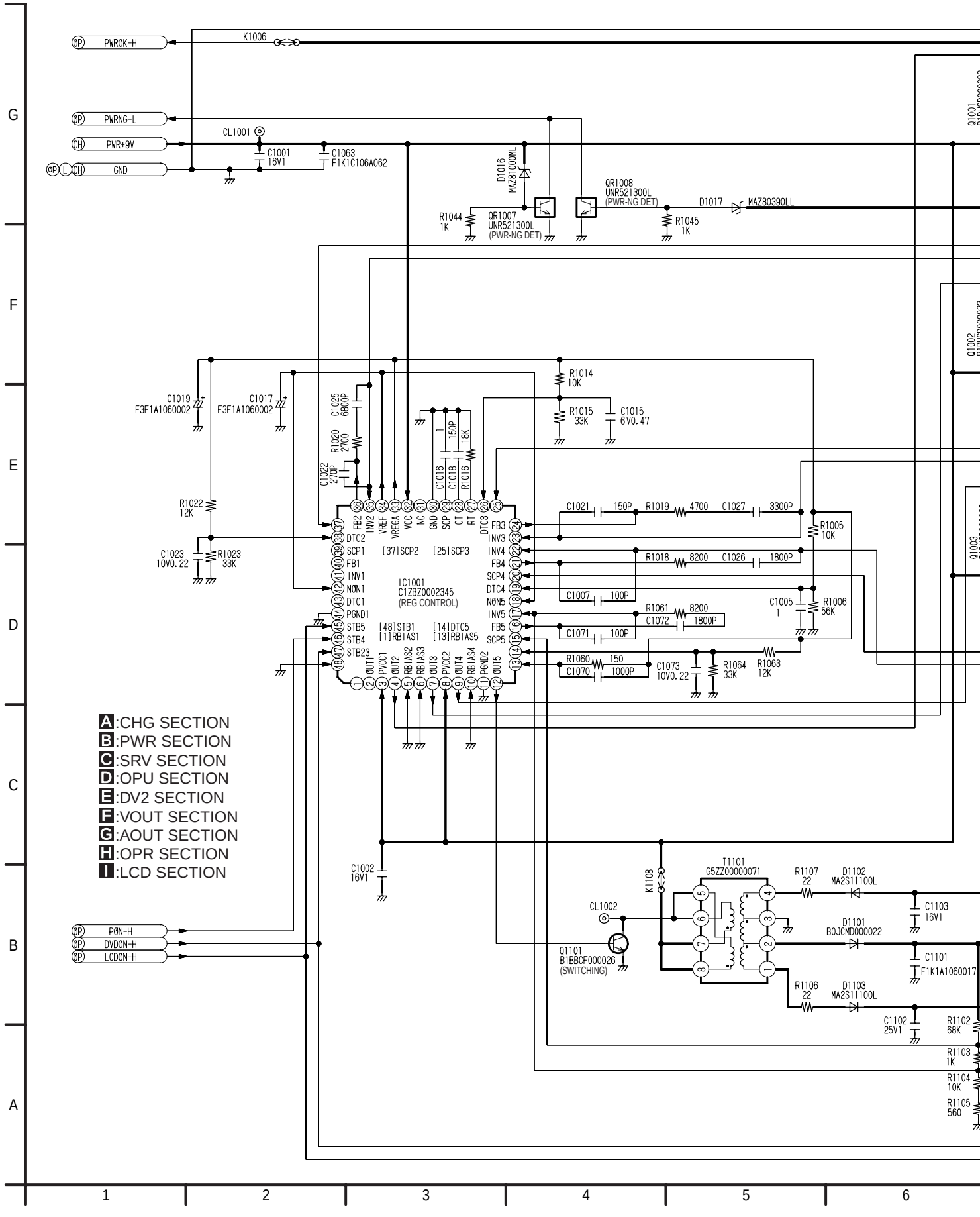
GRAM

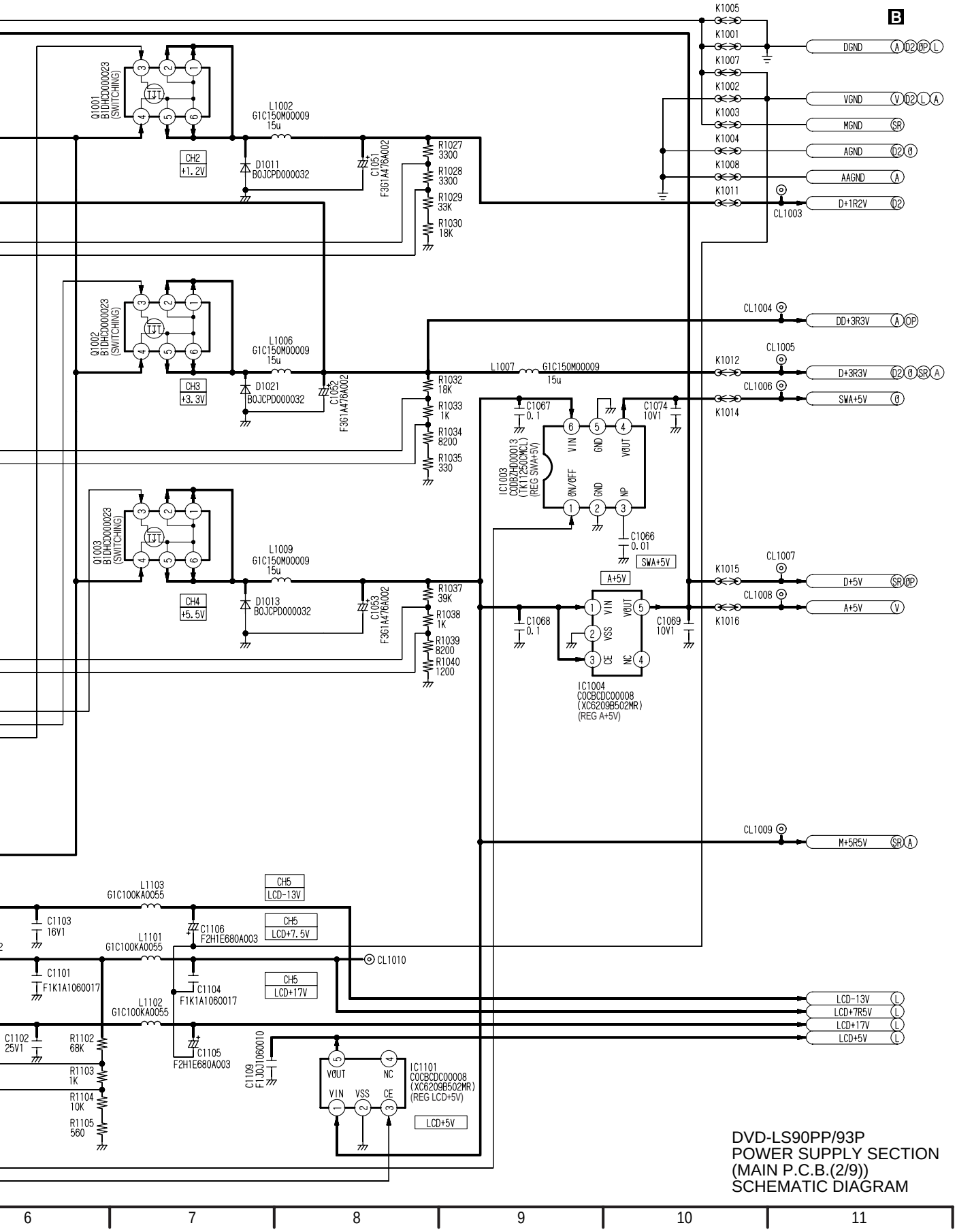


DVD-LS90PP/93P
CHARGE BATTERY SECTION
(MAIN P.C.B.(1/9))
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

16.2. POWER SUPPLY SECTION (MAIN P.C.B. (2/9)) SCHEMATIC DIAGRAM

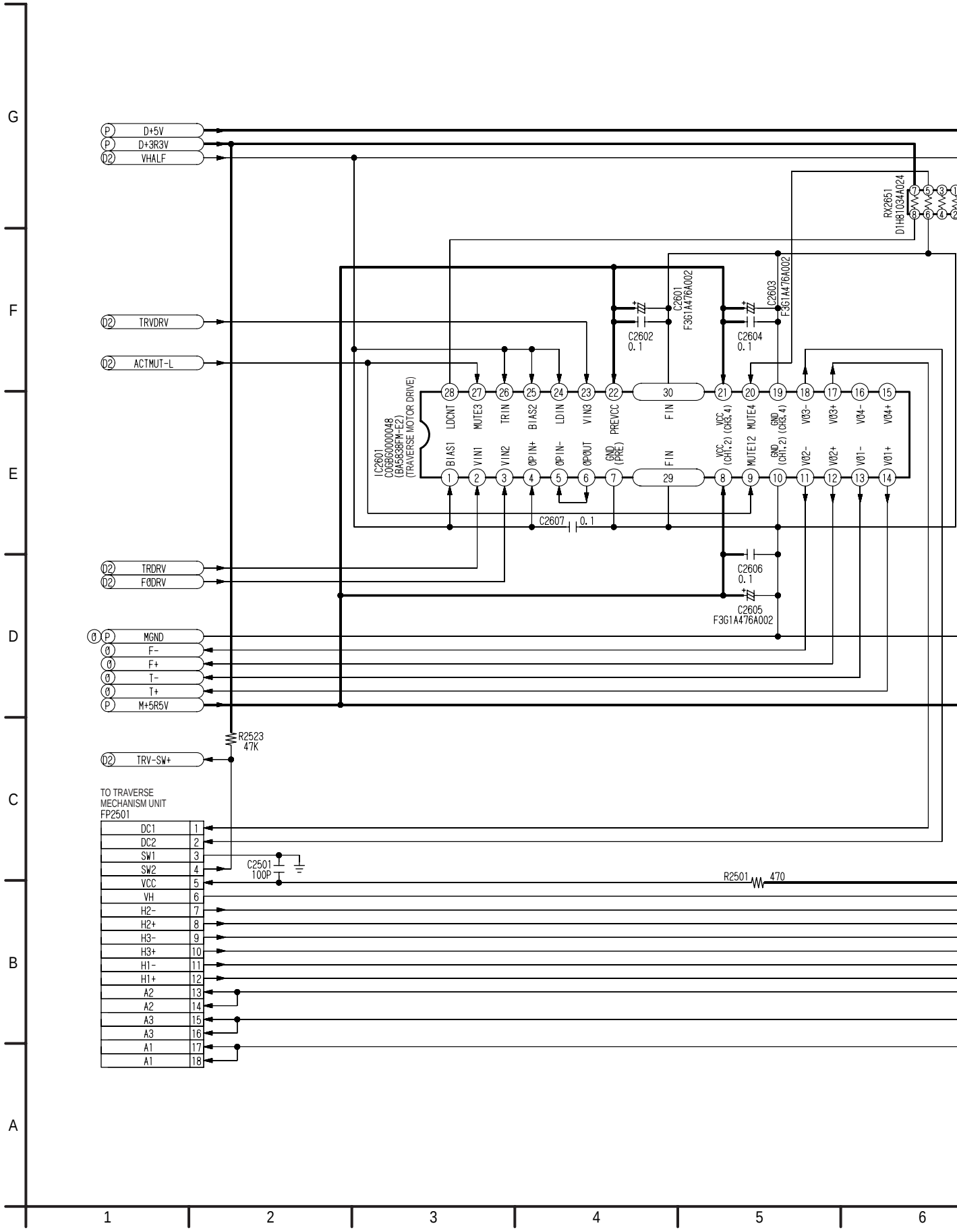




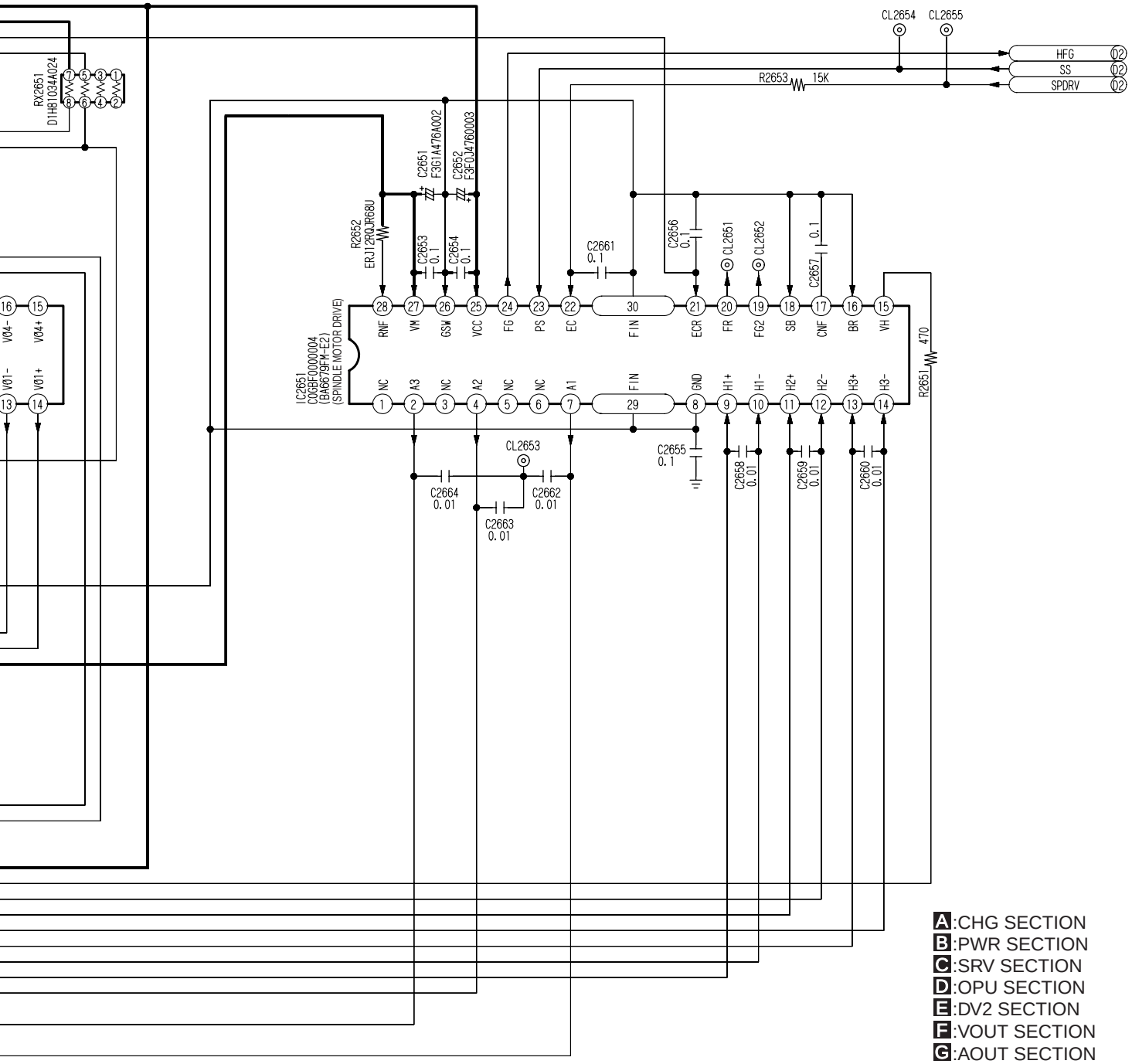
DVD-LS90PP/93P
POWER SUPPLY SECTION
(MAIN P.C.B.(2/9))
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

16.3. SERVO SECTION (MAIN P.C.B. (3/9)) SCHEMATIC DIAGRAM



C

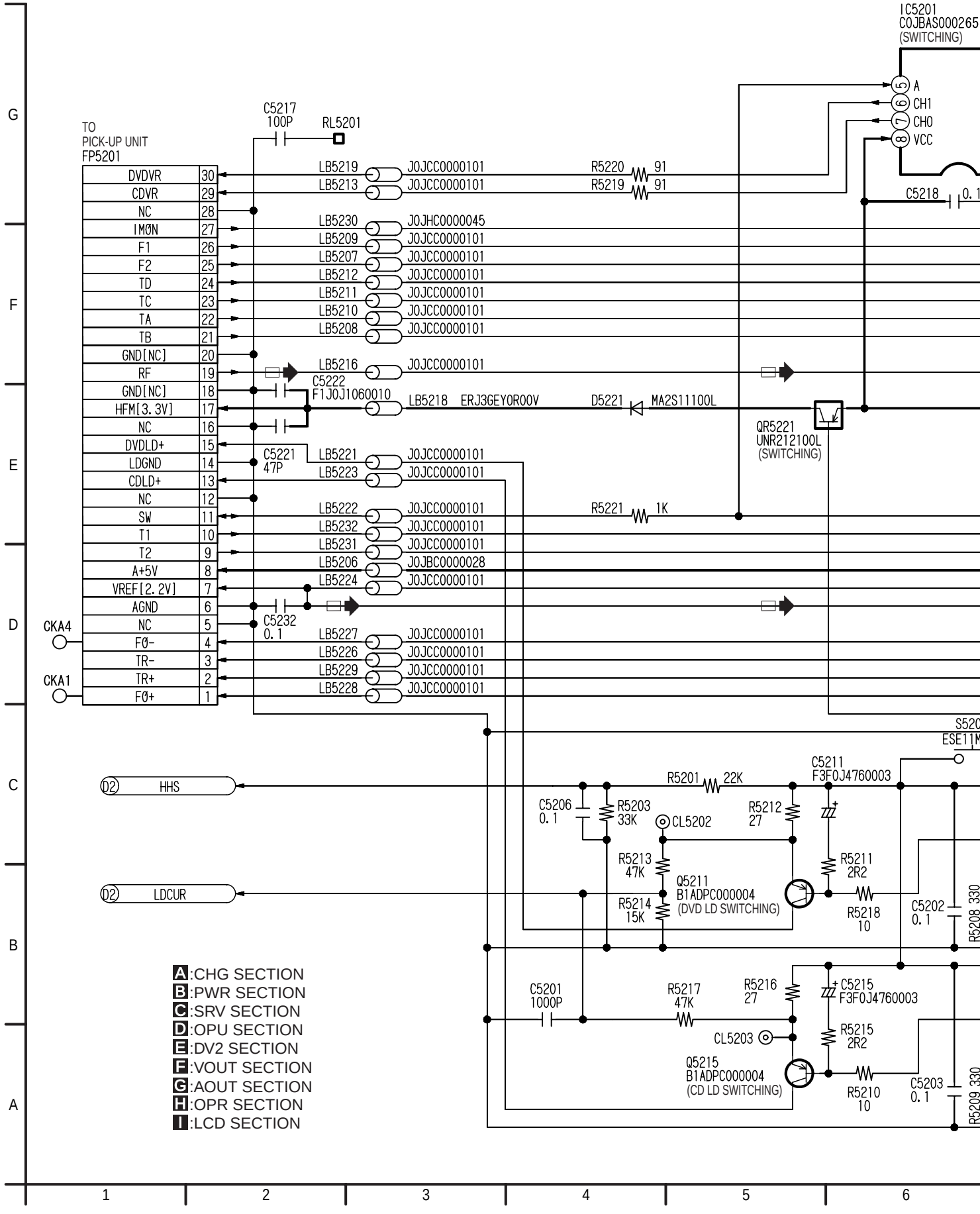


A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION

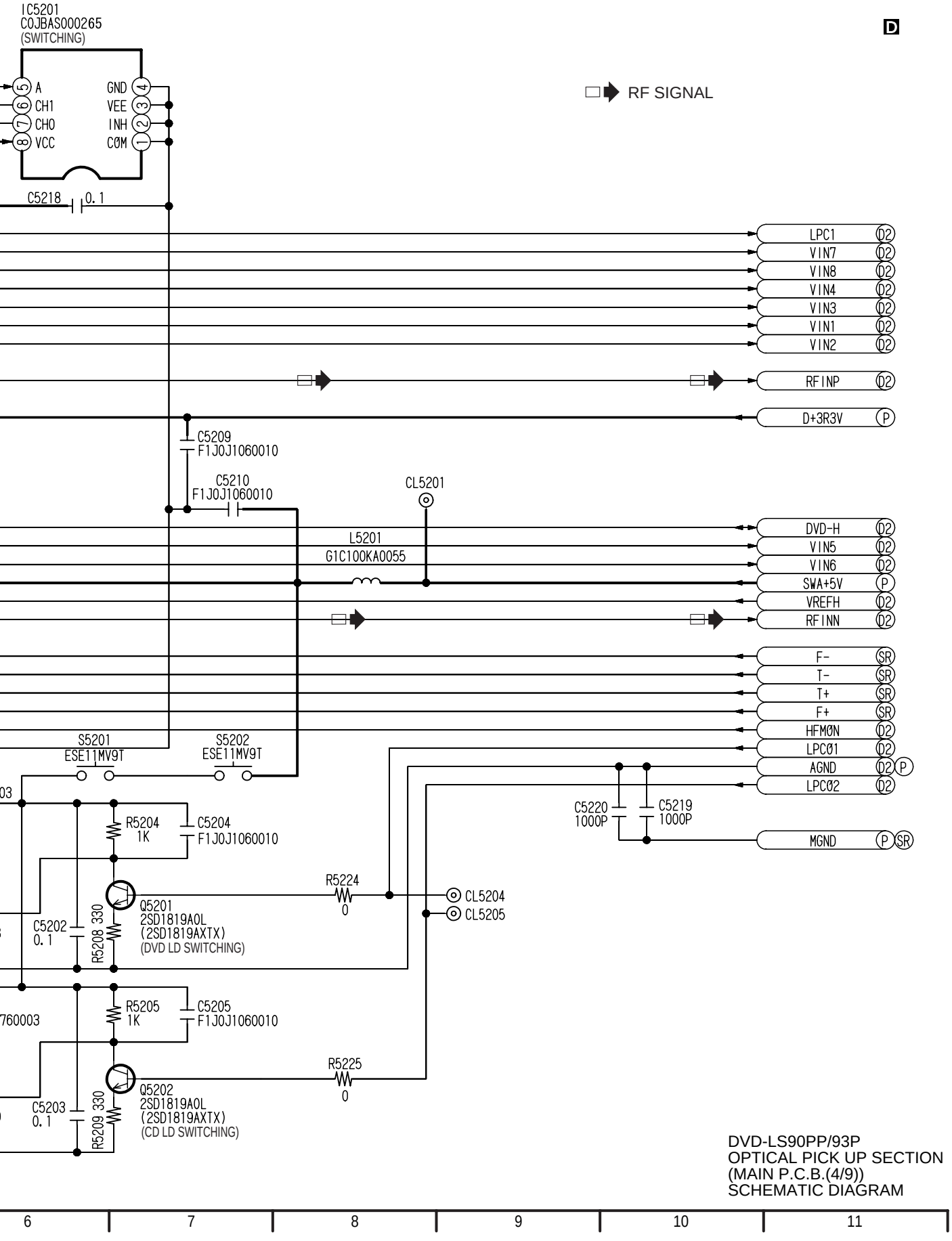
DVD-LS90PP/93P
SERVO SECTION
(MAIN P.C.B.(3/9))
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

16.4. OPTICAL PICK UP SECTION (MAIN P.C.B. (4/9)) SCHEMATIC DIAGRAM



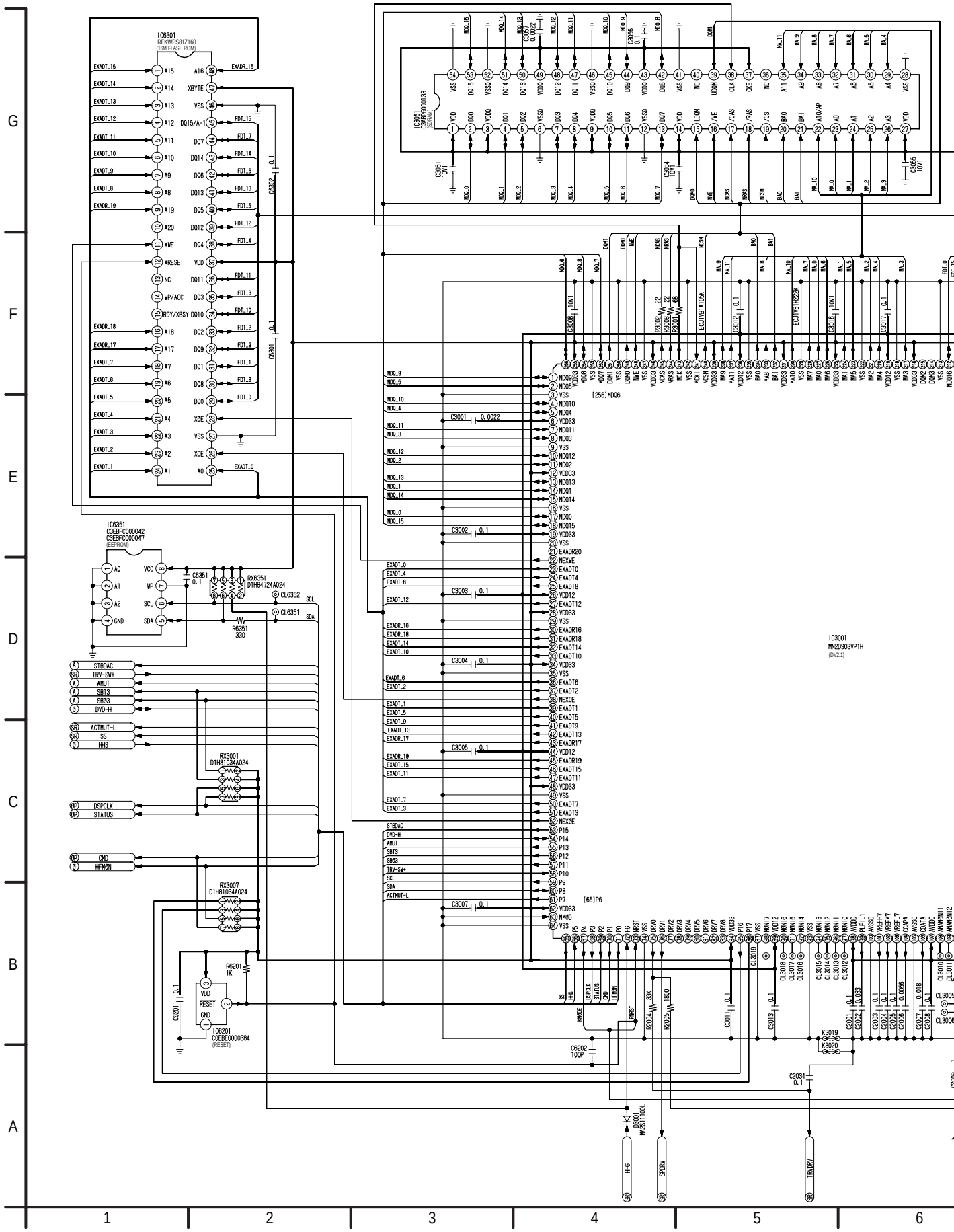
M



DVD-LS90PP/93P
OPTICAL PICK UP SECTION
(MAIN P.C.B.(4/9))
SCHEMATIC DIAGRAM

6 7 8 9 10 11

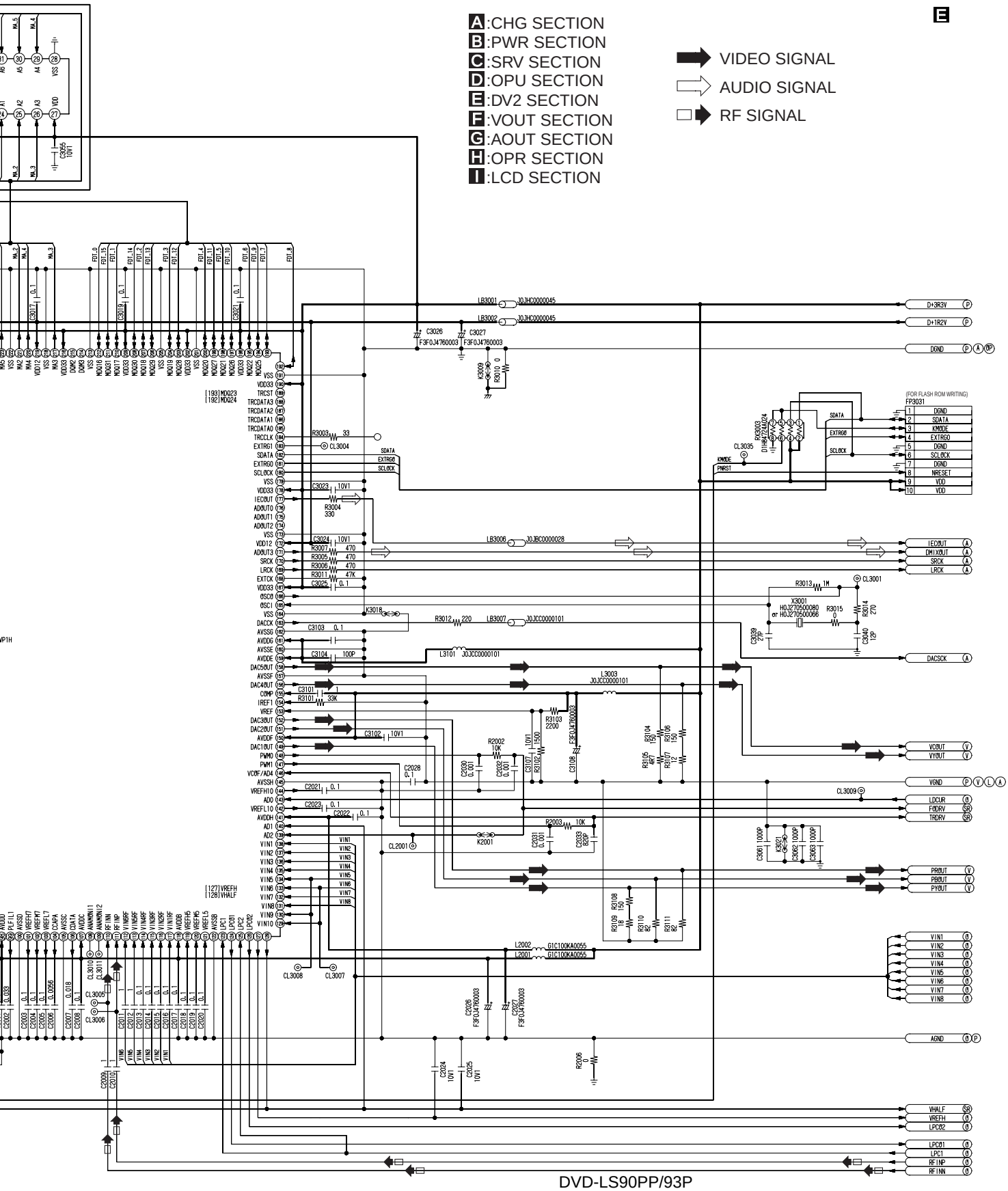
16.5. DV2 SECTION (MAIN P.C.B. (5/9)) SCHEMATIC DIAGRAM



E

A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION

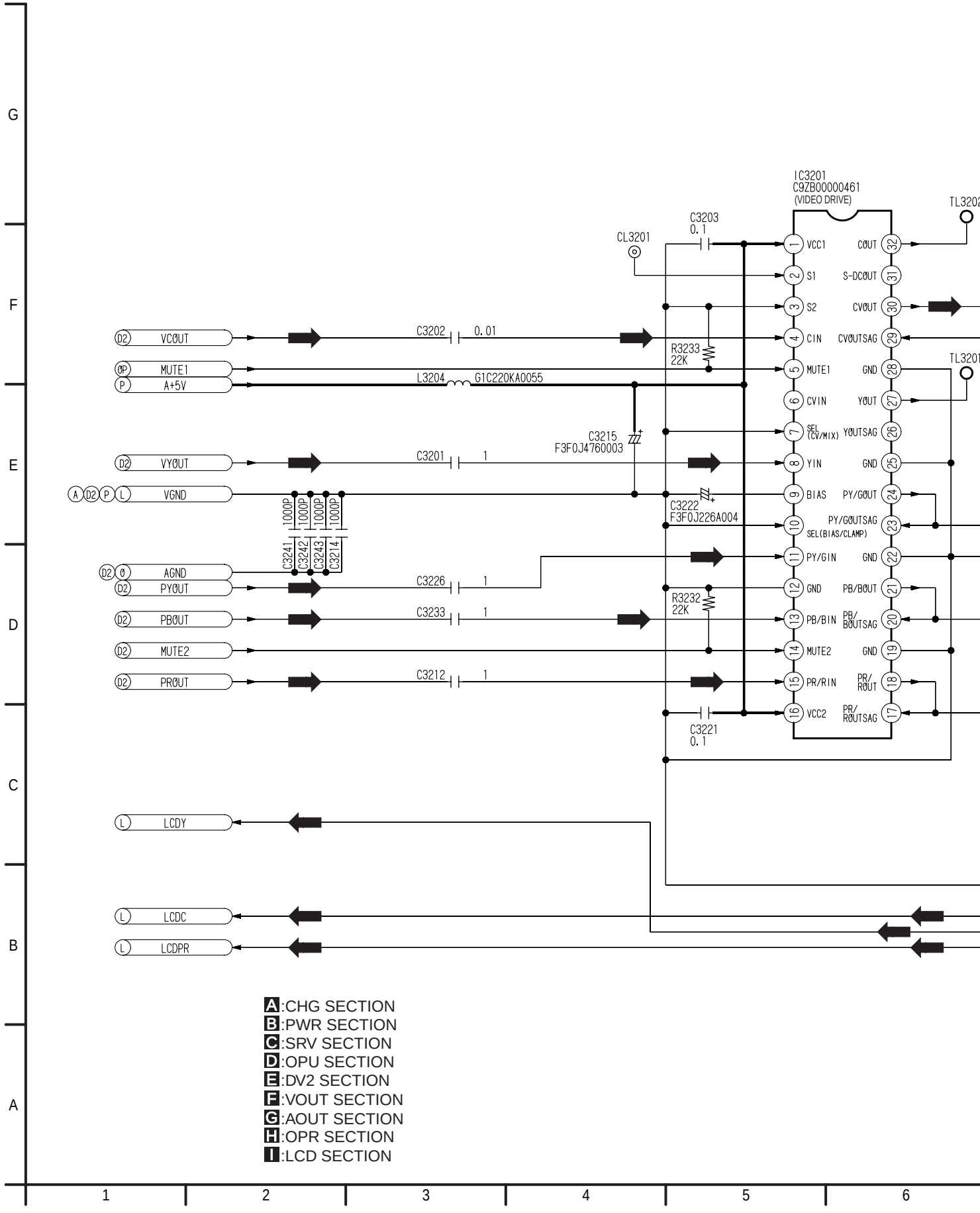
VIDEO SIGNAL
AUDIO SIGNAL
RF SIGNAL



DVD-LS90PP/93P
DV2 SECTION (MAIN P.C.B.(5/9)) SCHEMATIC DIAGRAM

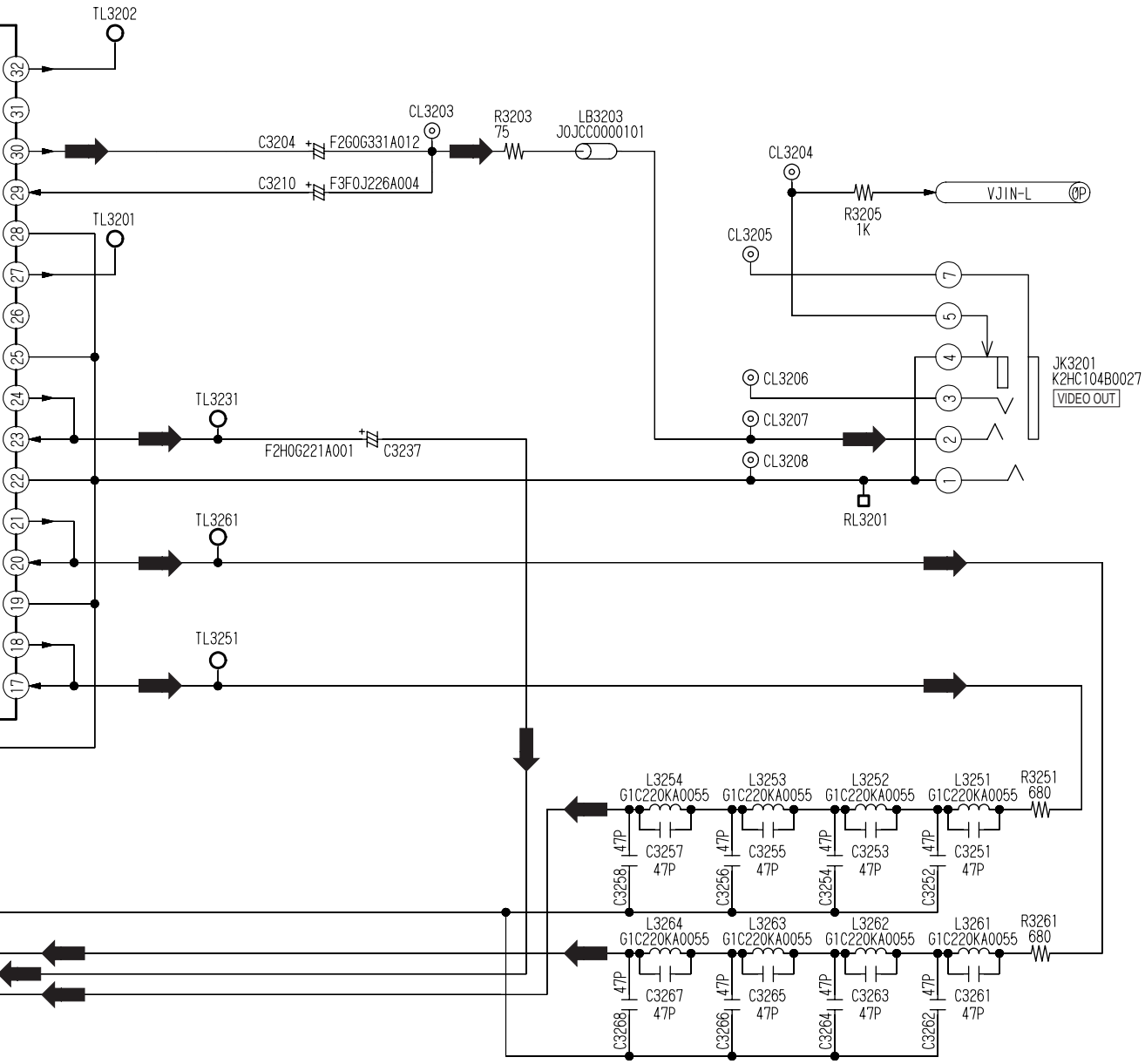
6 | 7 | 8 | 9 | 10 | 11

16.6. VIDEO OUT SECTION (MAIN P.C.B. (6/9)) SCHEMATIC DIAGRAM



F

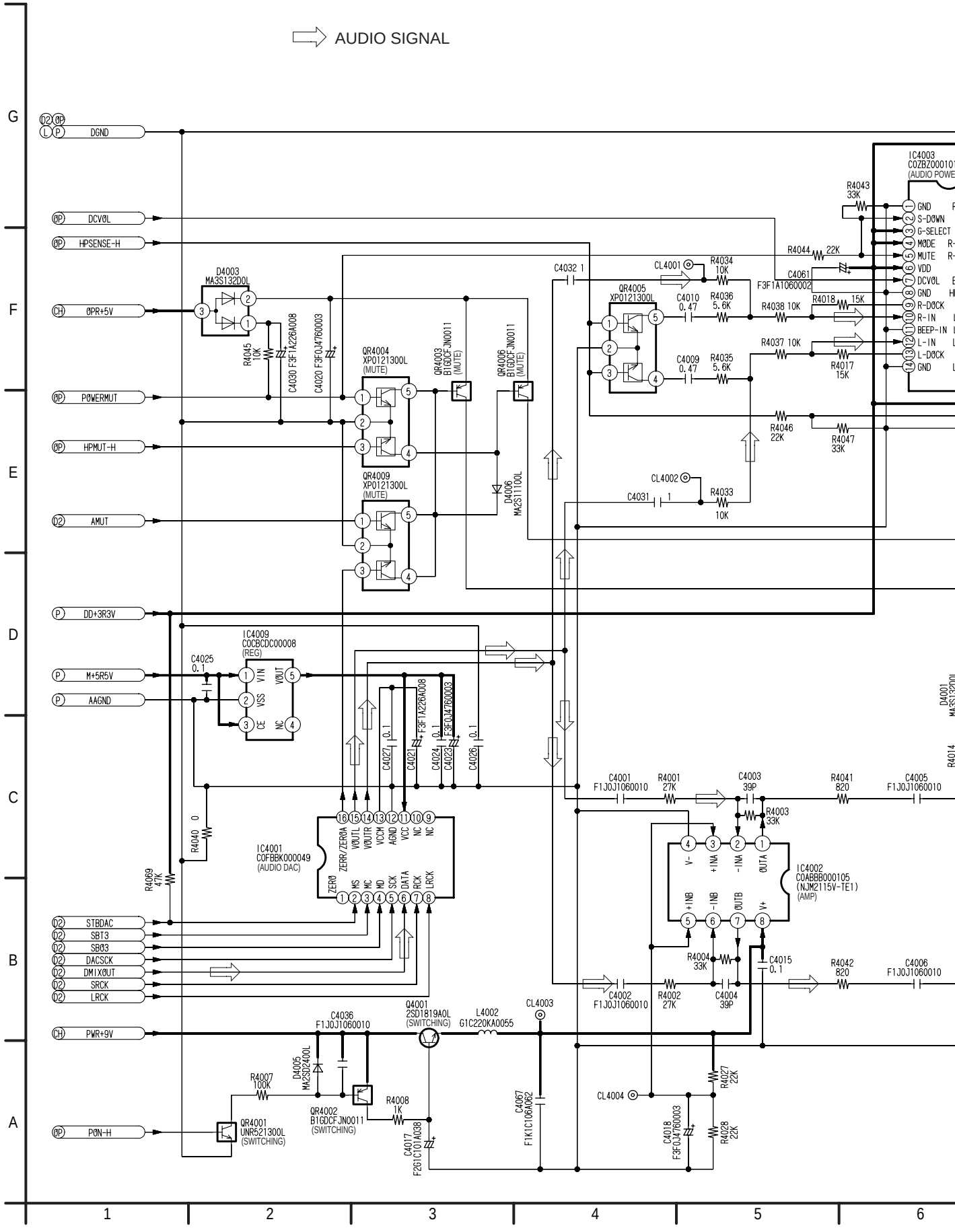
VIDEO SIGNAL

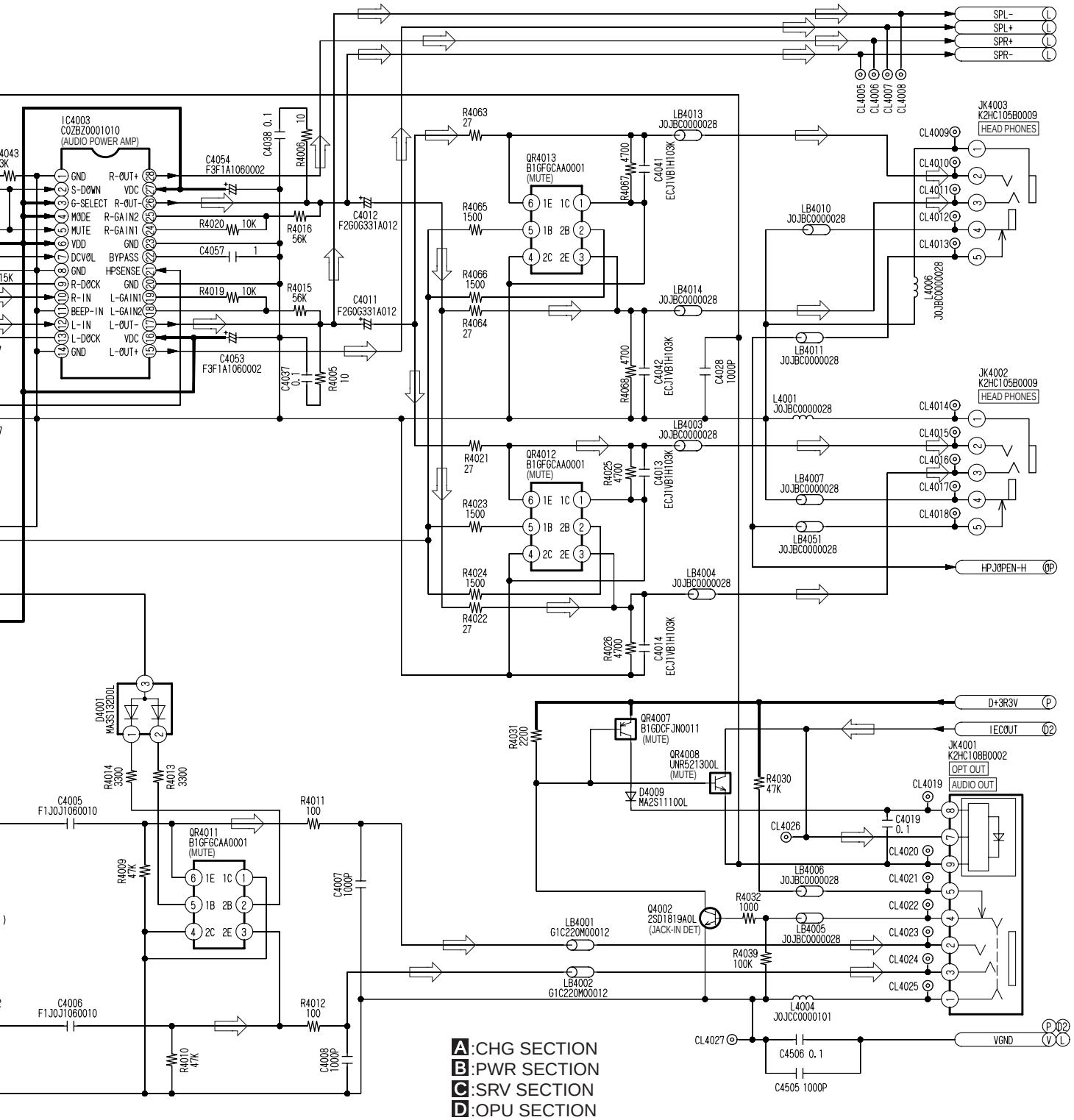


DVD-LS90PP/93P
VIDEO OUT SECTION
(MAIN P.C.B.(6/9))
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

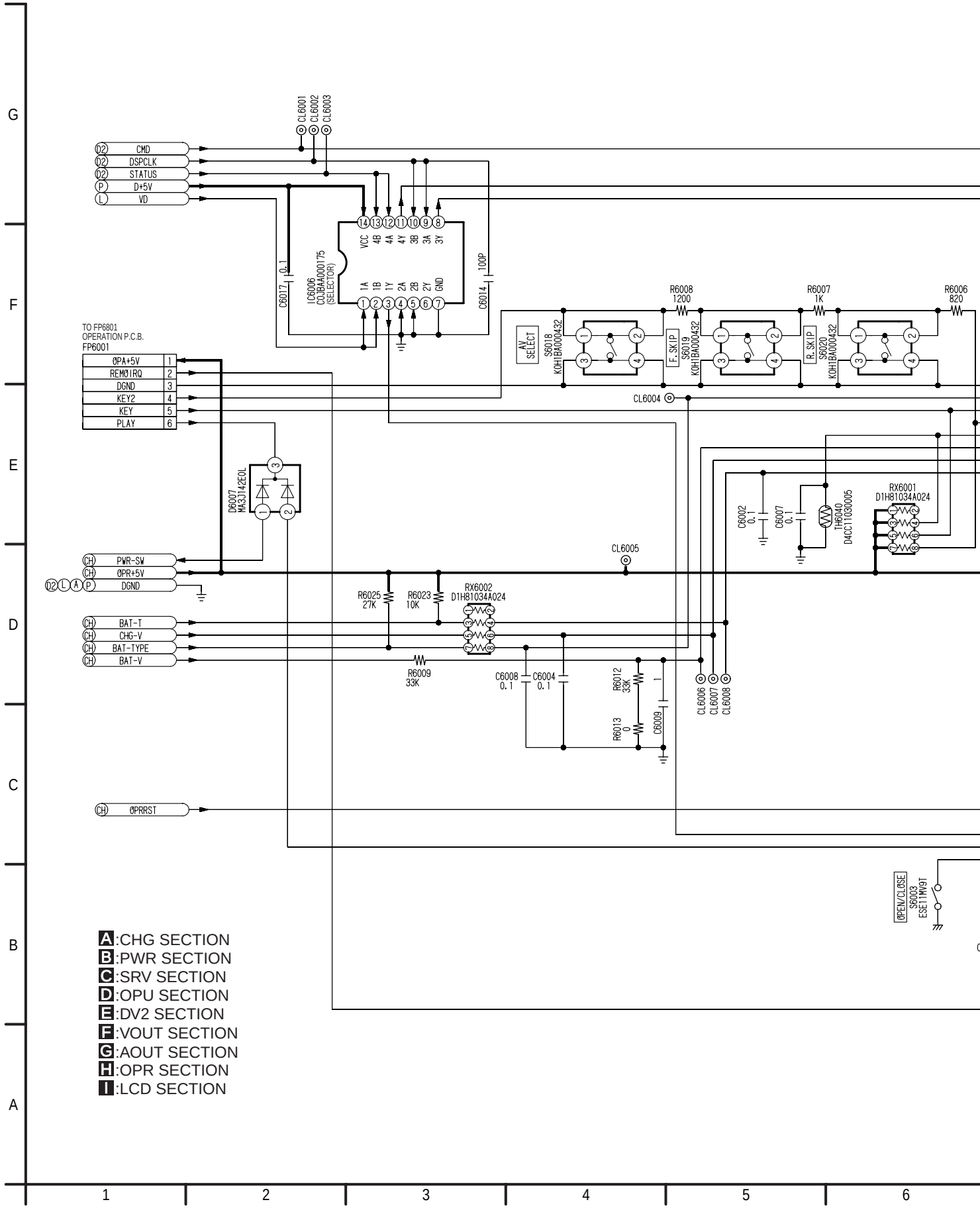
16.7. AUDIO OUT SECTION (MAIN P.C.B. (7/9)) SCHEMATIC DIAGRAM

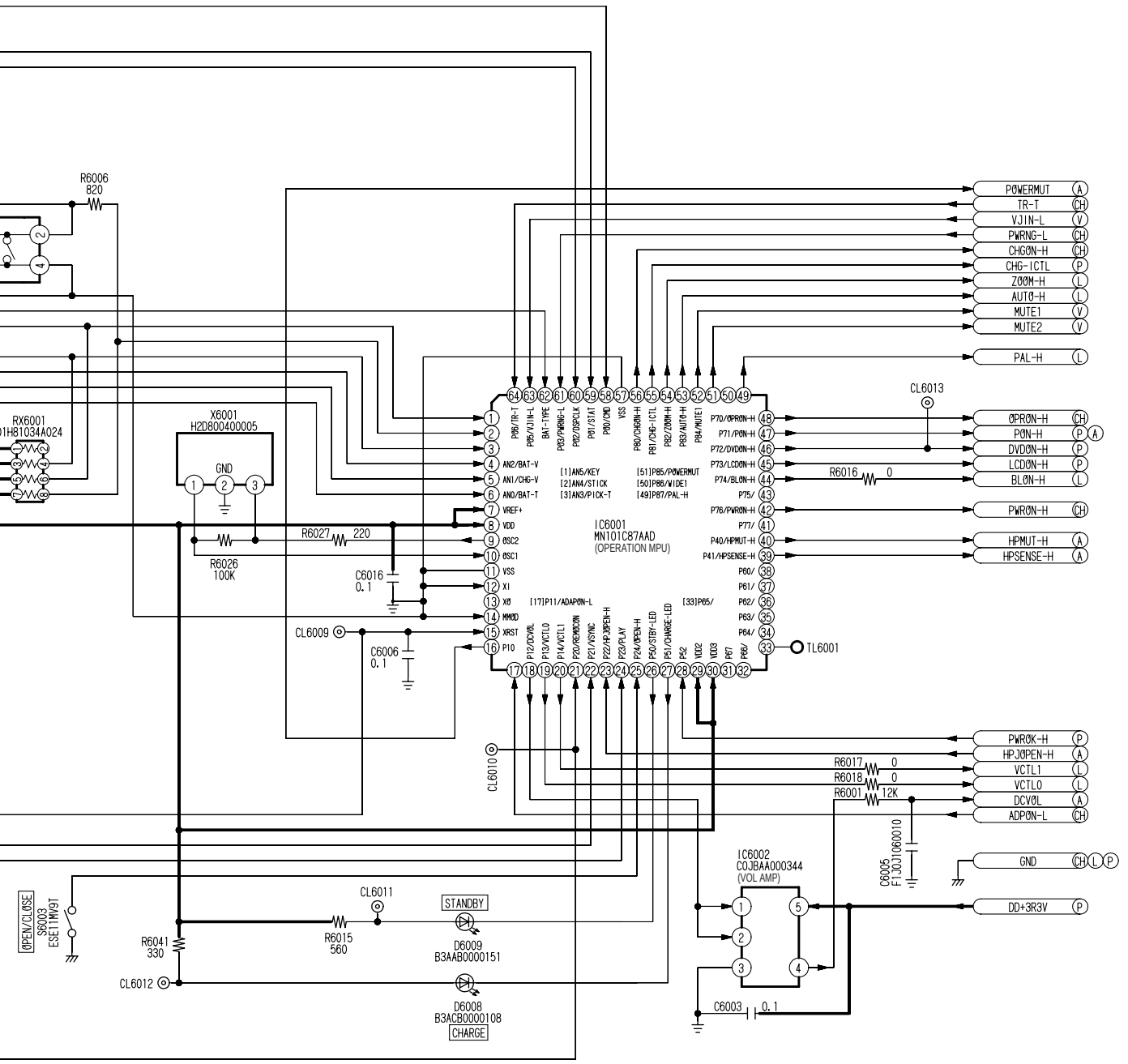



G
SPL-
SPL+
SPR+
SPR-
IC4003
C0ZBZ0001010
(AUDIO POWER AMP)
JK4003
K2HC105B0009
HEAD PHONES
JK4002
K2HC105B0009
HEAD PHONES
JK4001
K2HC108B0002
OPT OUT
AUDIO OUT
HPJ0PEN-H
D+3R3V
IEC0UT
VGND
QR4013
B1GFGCAA0001
(MUTE)
QR4012
B1GFGCAA0001
(MUTE)
QR4011
B1GFGCAA0001
(MUTE)
QR4007
B1GDCFJN0011
(MUTE)
QR4008
UNR521300L
(MUTE)
Q4002
2SD1819A0L
(JACK-IN DET)
D4001
MA3S13200L
D4009
MA2S11100L
LB4001
G1C220M00012
LB4002
G1C220M00012
L4001
J0JBC0000028
L4004
J0JCC0000101
L4006
J0JBC0000028
A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION
DVD-LS90PP/93P
AUDIO OUT SECTION
(MAIN P.C.B.(7/9))
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

16.8. OPERATION SECTION (MAIN P.C.B. (8/9)) SCHEMATIC DIAGRAM

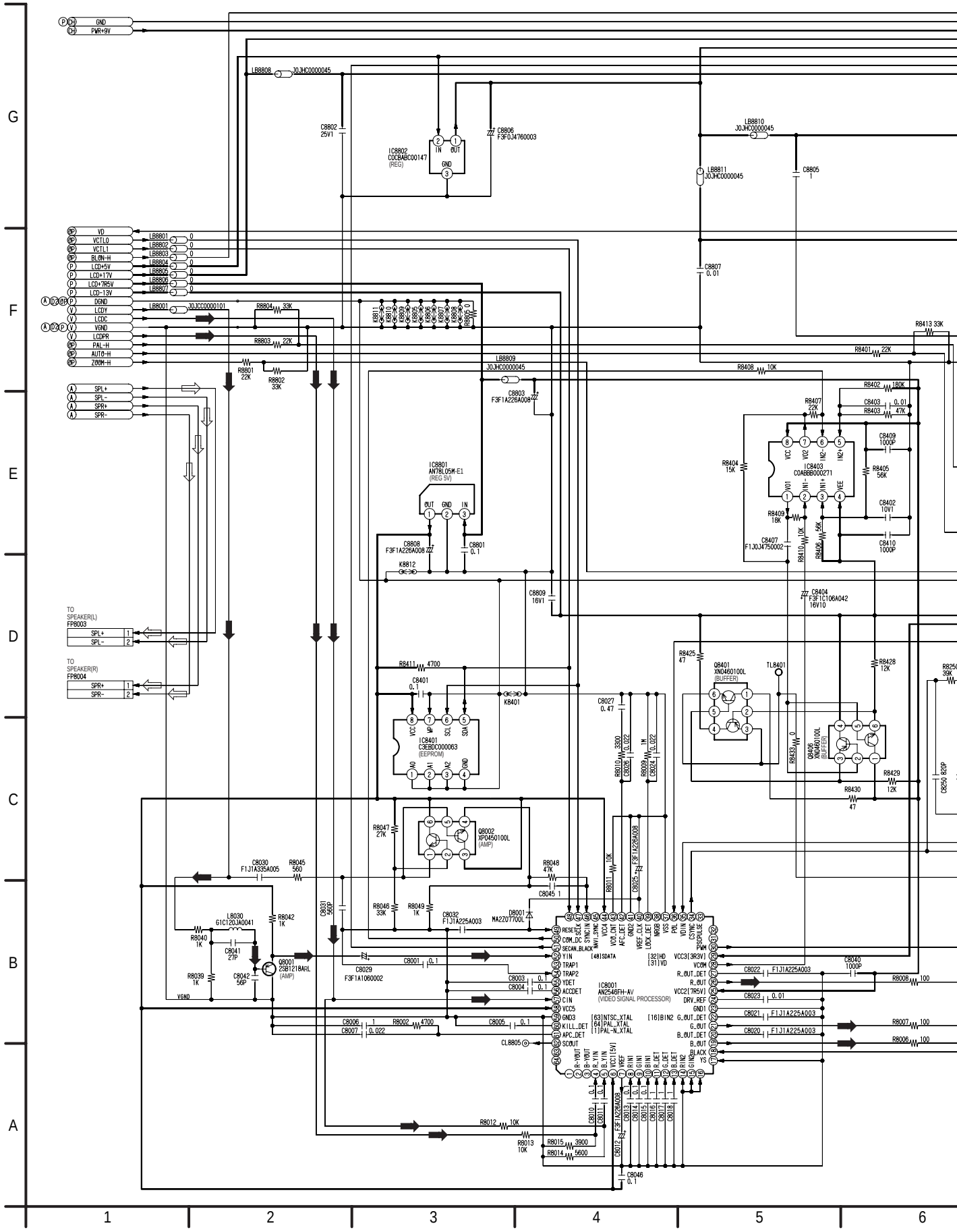


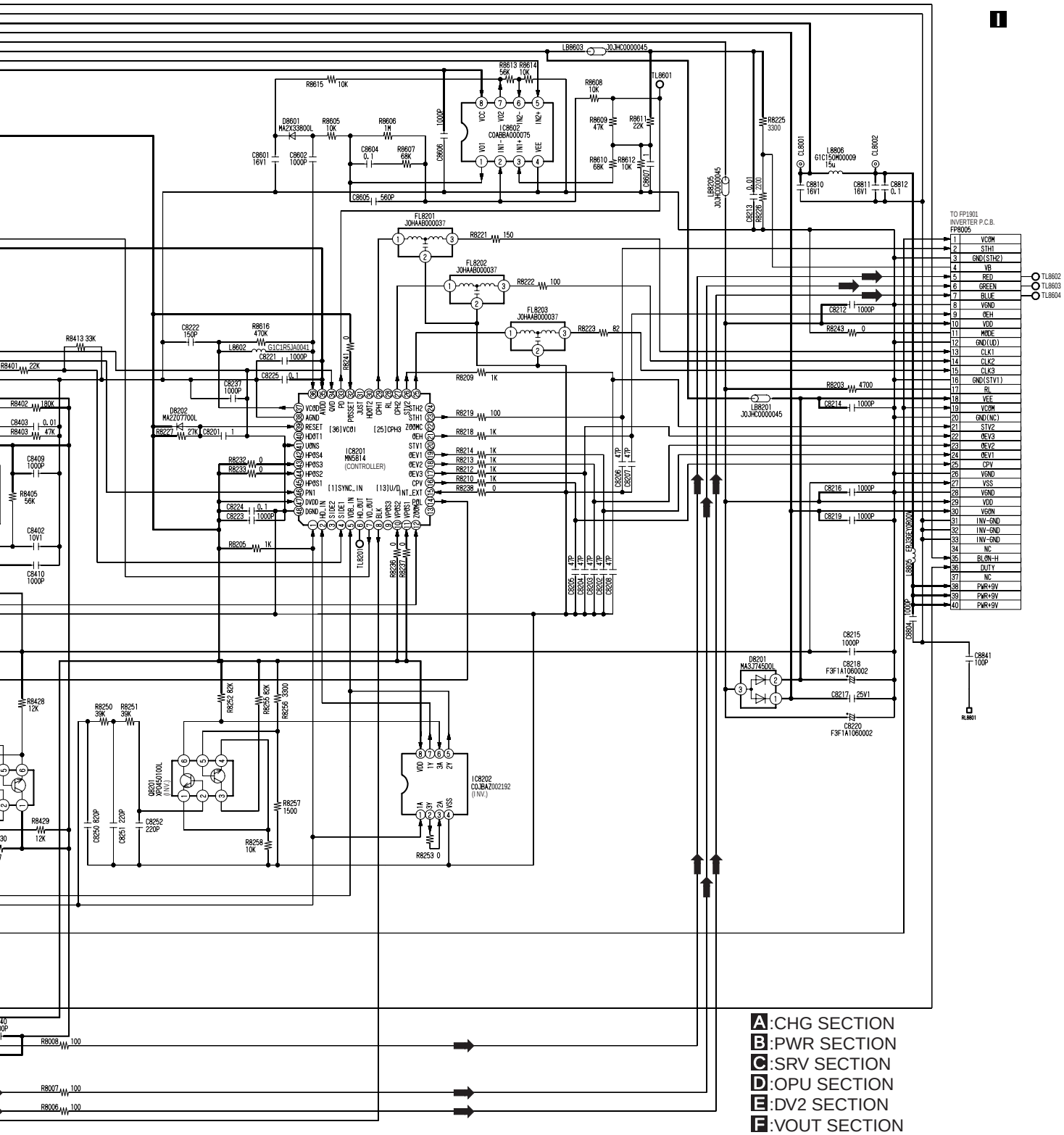


DVD-LS90PP/93P
OPERATION SECTION
(MAIN P.C.B.(8/9))
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11

16.9. LCD IF SECTION (MAIN P.C.B. (9/9)) SCHEMATIC DIAGRAM





A:CHG SECTION
B:PWR SECTION
C:SRV SECTION
D:OPU SECTION
E:DV2 SECTION
F:VOUT SECTION
G:AOUT SECTION
H:OPR SECTION
I:LCD SECTION

VIDEO SIGNAL
AUDIO SIGNAL

DVD-LS90PP/93P
LCD IF SECTION
(MAIN P.C.B.(9/9))
SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11